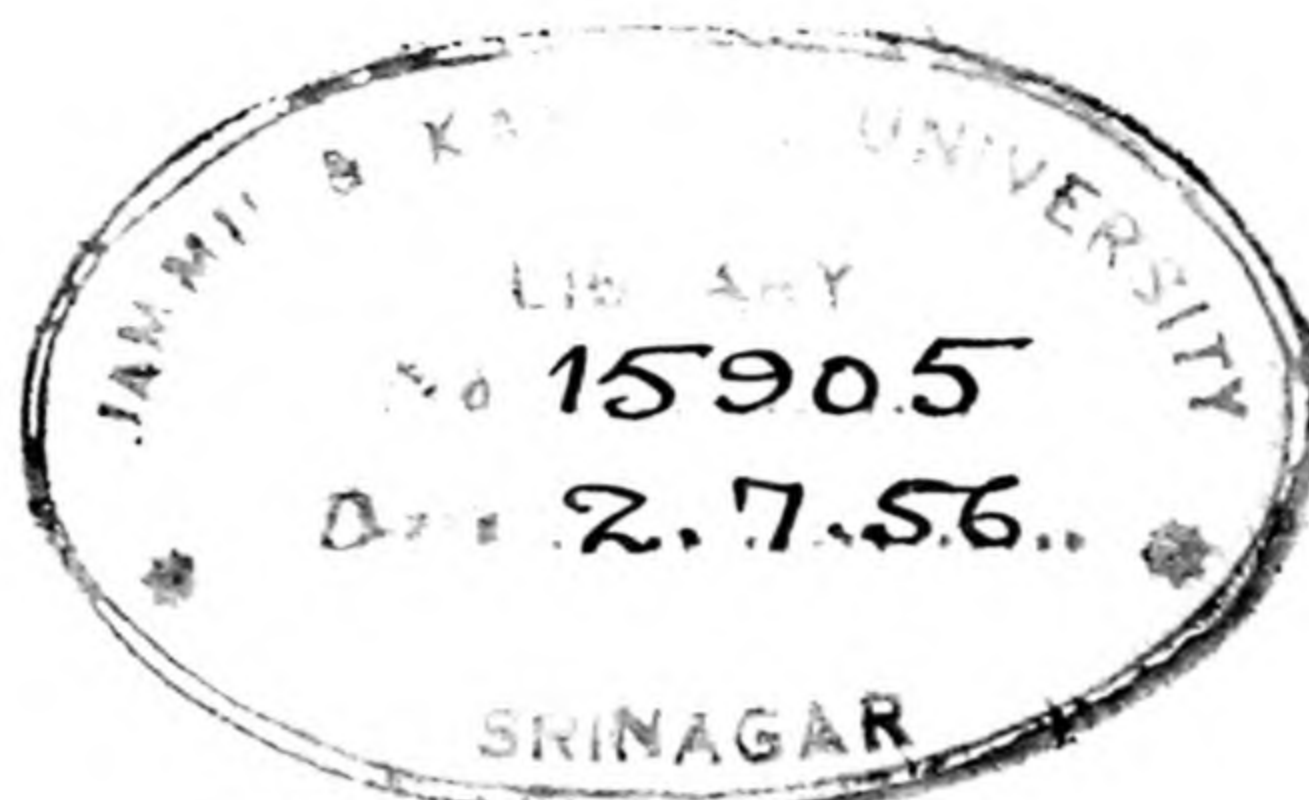


GOVERNMENT OF INDIA

AGRICULTURE AND
COMMUNITY DEVELOPMENT

PLANNING COMMISSION

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Explanatory Note

The expression 'lakh' and 'crore', which are frequently used signify 100,000 and 10 million respectively.



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INTRODUCTION

With the object of assisting study and implementation, the First Five Year Plan is being made available in the following sections:

- I. The Problem of Economic Development.
- II. Administration and Public Co-operation.
- III. Agriculture and Community Development.
- IV. Village and Small-Scale Industries.
- V. Irrigation and Power.
- VI. Development of Mineral Resources.
- VII. Industry and Communications.
- VIII. Social Services.

The numbering of pages in the different sections is in accordance with the text of the Plan.

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PART THREE
PROGRAMMES OF DEVELOPMENT

CHAPTER IX

STATE OF THE AGRICULTURAL ECONOMY

THE LARGEST portion of the natural resources of India, consists of land and by far the larger proportion of its inhabitants are engaged in the exploitation of land. In any scheme of planned economic development of the country, therefore, agricultural reorganisation and reform hold a position of basic importance. Recently on account of the growing need for food and raw materials this importance has been brought home to all sections of the community. While the several parts of the nation's economy are mutually inter-dependent and they must all receive their proper share of attention from the economic planner, the success of the whole Plan will vitally depend on the results achieved in making the most advantageous use of the land and labour resources engaged in agriculture. In this sense the importance of agriculture is both basic and vital.

LAND UTILISATION AND CROP PATTERN

2. The total geographical area of the country is 811 million acres, but land use statistics are available for only about 615 million acres which are as follows :—

	Million acres	Percentage to total
1. Forests*	93	15
2. Net area sown	266	43
3. Current fallows	58	9
4. Cultivable waste	98	16
5. Not available for cultivation	96	16
TOTAL	615†	100

The bulk of the 196 million acres, for which land utilisation statistics are not available, consists of mountains, deserts and inaccessible forests. The cultivated area (items 2+3) comes to 324 million acres. About 35.5 million acres grow more than one crop.

3. Including the conventional estimates which have been framed for non-reporting areas in respect of foodgrains, the gross cropped area is about 317 million acres. Its break up by crops is given in the appendix to this chapter. The appendix shows that food crops cover about 78 per cent. of the cropped area, and commercial crops, which provide raw

* The area under forests, for the Indian Union as a whole, including the non-reporting portion, is estimated at 147 million acres.

† Includes 3.5 million acres for which details are not available.

material for industries, account for 17 per cent. Plantation crops and spices cover no more than 1.1 per cent. of the area, though they not only occupy a position of great importance in the economy of the valleys in the north-east and the strip of territory along the south-west coast of India but also play a vital role in India's foreign trade.

TRENDS IN LAND USE PATTERN

4. Due to changes in coverage and methods of reporting it is difficult to obtain comparable data for the Indian Union as a whole over a sufficiently long period to indicate trends. A study of the data for some of the principal States where only slight changes in coverage have occurred, was, therefore, undertaken over a period of about 40 years (ending 1946-47) which brings out the following trends :—

- (i) The net area sown* has not increased appreciably except in Uttar Pradesh. The area growing more than one crop has increased by about 20 per cent. and the total cropped area, therefore, shows some increase, which, however, lags far behind the rapidly increasing population.
- (ii) Irrigated area has increased by about 10% mainly through the extension of canals. It has been noticed that the area irrigated from minor irrigation works has remained almost static over this long period. It seems to indicate that the new constructions have at best kept pace with works going out of use for want of repairs or otherwise, *e.g.*, through extension of canal irrigation.
- (iii) The area under current fallows remained at the level of 1919-20 till the early forties and thereafter showed some increase, particularly in the cotton growing tracts, possibly because of a sudden decrease in cotton area which was left partly fallow. Hyderabad is the only State which shows a continuous increase in fallows. In the opinion of a special committee set up by the Hyderabad Government the apparent increase in the area under fallows is somewhat of an exaggeration.

5. Another study of trends in crop pattern was based on the data relating to the main growing areas of different crops. This indicates the following trends :—

- (i) The area under food grains shows a small increase during the forties when the area under cotton declined.
- (ii) During the periods of the two world wars the acreage under cotton decreased. This trend was reversed in the post-war periods.
- (iii) Area under oil seeds, mostly groundnuts has steadily increased by about 4 million acres.
- (iv) A considerable increase of about a million acres has occurred in jute area since partition because of the intensive efforts made to fill the large gap created in the supply position after Partition.

* The apparent increase of about 1 million acres in the case of Bombay is due to reclassification of area from fallows to fodder crops.

- (v) The area under sugarcane has increased by about a million acres. A steady increase, though small in extent, is noticed in the area under cane in Madras and Bombay.

6. The above trends bring out two main facts of the agricultural situation, namely that (i) although gross cropped area has increased as a result of double cropping, little new area has come under cultivation during the last four decades and (ii) changes in price structure do affect the pattern of crops even though a large part of the area is cultivated in tiny holdings. A part of the area of cultivable waste can be utilised for extension of cultivation and afforestation. Though much of it may be fragmented, there is a considerable area in sizeable blocks. On the abolition of zamindari most of it has been nationalised. In spite of the increasing pressure of population, very little extension of cultivation to waste lands has taken place during the last 40 years. This seems to indicate that the available cultivable waste does not generally lend itself to reclamation within the present resources of the cultivators. Small areas may be added here and there, but for any schemes of materially increasing the area under cultivation, reclamation and rehabilitation work has to be undertaken on an organised scale. Only State efforts or State sponsored efforts can hope to do this. For making the best use of all available land a rapid survey to locate cultivable areas and classify them according to the measures necessary for their reclamation appears to be the first essential step.

7. In areas thus selected for agricultural development a major State effort at reclamation will be necessary. A primary necessity is of course to examine the schemes from all relevant technical and economic angles. Time, talent and money spent in this preliminary effort is an indispensable precaution and a profitable investment. Once the scheme is prepared, it may be put into effect through a public corporation or through a development board ; but when colonization or rehabilitation has commenced, the maximum possible scope should be given to co-operative action. While prospects of a significant increase in the area under cultivation are mostly connected with major schemes of development, no measure which is calculated to bring suitable land under profitable cultivation, even within the existing village settlements, should be neglected.

YIELD TRENDS

8. Extension of cultivation can be an important factor in stepping up agricultural production over a period of time. For meeting the immediate needs of the nation, however, reliance has to be placed mainly on increasing production from the existing area by improving the yields. The official estimates framed on a comparable basis indicate that while the area under cereals during the three years ending 1949-50 compared to the period immediately preceding the war has not changed appreciably, there has been a decline in the yield per acre from 619 lbs. to 565 lbs. The yield estimates which are based on normal yield and condition factor suffer from the defect of being subjective and the reported fall may be ascribable in part to caution on the part of State Governments in reporting their surpluses and deficits

from year to year for the purposes of the Basic Plan for food. Since 1944, a scientifically designed procedure for estimating production, based on the technique of random sampling and crop cutting experiments, has been introduced for some crops by the Indian Council of Agricultural Research. The estimates of production based on this technique are now available for 1949-50, 1950-51 and 1951-52, which indicate that while the official estimate for 1949-50 based on the standard yield and condition factor was slightly optimistic compared with the estimate based on the technique of random sampling, the official estimates for 1950-51 and 1951-52 were under-estimates by 6 to 7 per cent. as detailed below :—

				Official Estimates	Estimates based on random sample survey	Percentage variation
				(000 tons)	(000 tons)	
1949-50	.	.	.	46,018	45,465	+1.2
1950-51	.	.	.	41,786	44,242	—5.5
1951-52	.	.	.	41,264	44,407	—7.1

These figures suggest that while during favourable seasons the official estimates may be somewhat over-estimates, in bad seasons there is a distinct tendency to under-estimate production.

9. A study undertaken by the Ministry of Food and Agriculture to determine yield trends over the last 40 years indicates that in no State do all the crops show a consistent decline in yield. For commercial crops the data revealed clear evidence of generally increasing yields, and in respect of sugarcane an expansion of area as well. In respect of food crops also an expansion in area is perceptible in several cases as also an increase in the proportion of irrigated areas, but yield trends are not uniform ; yields show an increase for certain crops in certain States, a decline in certain others and absence of any perceptible change in the rest. Generally speaking, an expansion of area under a crop has been seen to be a factor associated with the lowering of yield rates, while an increase in the proportion of irrigated area has the opposite effect. In a few cases yield trends are difficult to explain on these grounds and these cases merit further examination. The study concludes that there is little ground for the belief that there has been a deterioration in soil fertility or in the standard of husbandry in recent years.

10. The study referred to above was also based on the official estimates, though for the States selected for the study the estimates of production were comparatively more reliable. The official estimates of average and total yields for individual years, were useful as guides for administrative action, particularly for food crops. It would not, however, be justifiable to place too great a reliance on them for purposes of comparison of yields as between different years as a measure of land fertility. The estimates based on sample surveys are available

only for a few years and they do not cover all crops. On the basis of the data available to us, we would hesitate to arrive at any conclusion regarding yield trends. With a more extensive coverage and with an accumulation of data for several years these surveys will produce significant data on long term trends. In the interest of a planned agricultural policy, therefore, the adoption of the technique of random sample surveys for the preparation of official estimates of production in all States should get a high priority.

AVAILABILITY AND REQUIREMENTS

11. *Cereals*—While the population has increased by about 39 per cent. during the last four decades, the production of foodgrains has not kept pace with it. This indicates an appreciable decrease in *per capita* availability of foodgrains from internal sources. For more than three decades India has been getting a much larger quantity of grains (mainly rice) from Burma than what it was exporting to other countries. The separation of Burma in 1936 has reduced internal supplies by about 1.3 million tons, and the Partition in 1947 by a further 0.77 million tons. Since 1948 we have been importing large quantities of foodgrains, 2.8 million tons in 1948, 3.7 million tons in 1949, 2.1 million tons in 1950, and 4.7 million tons in 1951.

12. Defects in agricultural statistics introduce an element of uncertainty in estimating the overall deficit which has to be met. The existing gap between availability and requirements and that which may come to exist in 1956, if in the meantime, production does not increase may be seen from the following statement* :

1. Estimated population (millions)	1950	353.05
	1956	377.60
2. Estimated adult equivalent population at 85% (millions).	1950	303.62
	1956	324.74
3. Production of cereals in 1949-50 (million tons)		45.13**
4. Quantity available for consumption in 1950 from internal supplies allowing for seed etc. at 12½ % (million tons)		39.49
5. Quantity available for consumption including imports and off-take from carry over stocks (million tons)		42.40
6. Availability per adult, per day in 1950 (ounces)		13.71

* The figures in the statement exclude Jammu and Kashmir and Sikkim.

** As corrected on the basis of random sample surveys.

7. Requirements for consumption including seeds etc. in 1956 (million tons)—	
(i) On the basis of 13·71 oz. per adult per day	51·82
(ii) On the basis of 14 oz. per adult per day	52·01
8. Deficit compared to production at the 1950 level (million tons)—	
(i) On the basis of 13·71 oz. per adult per day	6·69
(ii) On the basis of 14 oz. per adult per day	7·78

To do away with imports and maintain consumption at the level of 1950, *i.e.*, 13·71 ounces per adult per day, the additional quantity of foodgrains needed in 1956 will be 6·7 million tons. The requirements of cereals for a balanced diet have been laid down by the Nutrition Advisory Committee at 14 oz. and to raise consumption to this level the additional quantity required is estimated at 7·8 million tons. These figures indicate the magnitude of the problem that lies ahead.

13. *Pulses*—The position regarding availability of pulses is no better. The production of gram and other pulses during 1950-51 is estimated at 8·4 million tons. After allowing about 20% for stock feeding and seed etc. the net quantity available for human consumption may be estimated at 6·7 million tons. This means an availability of 2·1 ounces per adult per day as against 3 ounces recommended by the Nutrition Advisory Committee for a balanced diet. At the level of 1951 availability the additional requirements of the increased population during 1955-56 will be 0·5 million tons and to obtain the nutritional standards the additional requirements will be 4 million tons.

14. *Subsidiary foods*—The principal subsidiary foods in use in India are potatoes, tapioca and sweet potatoes. With their high yields per acre they have a special importance in a country deficit in foodgrains. Potatoes are consumed on a small scale as vegetables rather than as the staple diet because of their high price over a large part of the year. Lowering their cost depends very largely on providing facilities for storage, dehydration and transport more cheaply than at present. Tapioca which is rich in starch forms an important article of diet in parts of Madras, Mysore and Travancore-Cochin. Though, by itself, it has a low nutritive value, it makes a good supplement to both rice and wheat.

15. *Protective foods*—The present availability of fruits and vegetables is estimated at 1·5 and 1·3 ounces per adult per day respectively. The requirements of a balanced diet are, on the other hand, estimated at 3 ounces of fruits and 10 ounces of vegetables. The availability of milk is estimated at 5·5 oz. per adult per day as against the nutritional requirements of 10 ounces. Similar figures for fish are 0·2 and 1·3 ounces. Little information is available regarding the availability of meat and eggs ; it is, however, known to be very low. Generally speaking, there is throughout the country too great dependence on foodgrains and insufficient consumption of protective foods.

16. *Sugar*—Production of sugarcane during 1950-51 stood at 5.62 million (*gur*) tons and net availability for human consumption at 1.62 ounces per adult per day as against the requirements of 2 ounces for a balanced diet. To raise consumption to this level during 1955-56, the additional quantity required is 2.2 million tons.

17. *Oils and fats*—Production of the five major oil seeds for 1950-51 has been estimated at 5.1 million tons and the net availability in terms of oils at about 1.69 million tons (including imports of 23 thousand tons of copra and coconut oil and allowing for exports of 168 thousand tons). Of this 118 thousand tons were utilised for the manufacture of soaps, paints and varnishes and as lubricants and the net quantity available for human consumption was thus 1.57 million tons of oil. This marks an increase of about 35 per cent. over the pre-war triennium. Even so the availability per adult per day stands at 0.5 ounces only. The other important source of fat in the Indian diet is ghee and the *per capita* availability of ghee works out at no more than 0.1 ounce per day. Including all the sources the *per capita* availability of oils and fats is far below what is considered necessary for nutrition.

18. *Cotton*—Production of cotton during 1950-51 was officially estimated at 2.97 million bales of 392 lbs. net each and consumption at 4.07 million bales. The gap between production and consumption was met largely by importing 0.83 million bales during the year. The requirements for 1956 have been estimated at 5.4 million bales and the gap between production and requirements may thus increase to about 2.4 million bales unless production is stepped up meanwhile. A part of the requirements of long staple cotton, which is not grown in India in sufficient quantities, has, however, to be imported for a long time to come.

19. *Jute*—In spite of the large expansion of the area under jute which has taken place during the last few years, the gap between availability and requirements is still wide. The official estimate of production during 1950-51 was 3.3 million bales of raw jute and 0.6 million bales of mesta—an inferior type of substitute. The requirements for 1955-56 are estimated at 7.2 million bales. This indicates a gap of about 3.3 million bales between supply and requirements.

TEA, COFFEE AND RUBBER

20. Plantations of tea, coffee and rubber cover less than 0.4 per cent. of the cropped area, concentrated mainly in the valleys of the north-east and along the coast on the south-west of India. They provide employment to more than a million families and thus play a vital role in the economy of these regions. In addition, they earn for India about Rs. 80 crores of foreign exchange. Tea alone accounts for Rs. 78 crores. A remarkable fact about tea plantations is that while the area under tea has remained unchanged for over a decade under international agreements, production has increased by about 43 per cent. over this period. This incidentally brings out that where sufficient capital is invested, yields can be increased appreciably. Coffee and rubber, which used to be export commodities are now largely consumed within the country. India actually imported about 12 million pounds of rubber during 1950-51. Rubber occupies a key position in industrial development and for defence. In view

of the uncertainties of the international situation dependence on imports may be inadvisable. The bulk of the area under rubber is comprised of small holdings which are on the whole comparatively less efficiently managed than the tea and coffee plantations. Production has declined since 1945 because of a fall in the yields of old plantations and increased suspension of tapping due to unremunerative prices. Their rehabilitation demands immediate attention. The Development Committee for rubber plantations has formulated a fifteen-year plan for their rehabilitation and development and from this large increases in yield are expected.

CONDIMENTS AND SPICES

21. In spite of phenomenal increases in prices little change in area under condiments and spices appears to have occurred. The area under black pepper, an important dollar earner which yielded Rs. 20 crores from exports of 15 thousand tons during 1950-51 as against an annual pre-war average of Rs. 3 lakhs, still stands at 1,98,992 acres and has recorded only a nominal increase. Official estimates of the areas under cardamom and lemon grass are not available ; trade estimates place the average areas in the neighbourhood of one lakh acres and twenty-seven thousand acres respectively. Cardamom yields Rs. 1.46 crores of foreign exchange. Cashew nuts, which bring another Rs. 8 to 9 crores of foreign exchange through exports, are largely imported, processed and then exported, the value of the imports being of the order of about Rs. 2.8 crores. The condiments and spices have acquired a position of great importance in the economy of the plains on the south-west coast of India. It is likely that the industry may have shortly to face competition from Indonesia and Malaya. Moreover, the high level of prices may not be maintained. A downward trend is already evident. This industry lacks the organisational advantages which are enjoyed by other plantation industries like tea, coffee, and rubber. Even the exports are generally not graded and this has often led to avoidable losses. The Government of India have recently set up a committee to examine the whole position in respect of these crops, and particularly the question of their production and marketing being brought under a single organisation.

APPROACH TO AGRICULTURAL DEVELOPMENT

22. In this chapter we have attempted to state briefly the main features of the agricultural situation in India. The facts cited above may seem to suggest that the rural economy has been largely static. Some notable developments have, however, occurred over the past few decades. Large areas which suffered from repeated failures of rainfall have received irrigation ; new crops have come to occupy a significant position in the country's production and trade ; the agricultural and the industrial economies in the country now exert a powerful influence on one another ; problems of rural indebtedness and the village money-lender exercise the administration and the people much less than they did fifteen or twenty years ago ; and finally, there is already in the countryside an awakening and a desire for raising standards of living. The even tenor of the agricultural economy was seriously disturbed as a result of the Partition ; but much adjustment has already taken place. In describing the state of the agricultural economy it was necessary to give special attention to the facts of agricultural production. An assessment of the state of production is, however, no more than a starting point for the consideration of the conditions which determine agricultural development. This task is attempted in the chapters that follow.

23. The peasant's life constitutes an integrated whole and his problems interact to such an extent that he does not see them in compartments. In the same way, in approaching agricultural development, the peasant's life and problems have to be viewed together, no doubt selecting the points at which special emphasis is needed, but aiming always at a comprehensive and many-sided effort to transform the peasant's outlook and environment. The end in view is the development of the human and material resources of the rural community. This is to be achieved in the main by enabling the rural people to solve their own problems and to organise themselves for co-operative action with a view to adapting new knowledge and new resources to their needs. Thus, while co-operation offers the basis of community action, it falls to the administrative machinery of the government and, in particular, to extension workers, to provide guidance and help to the villager.

24. A rigid social structure and unutilised resources have always characterised under-developed economies. To change the social pattern built round the ownership of land and to bring new resources and technology into everyday operations become, therefore, central to the process of development. It is the purpose of planning to bring about rapid changes in such a way that the economy moves forward in a balanced, integrated manner, keeping in view at all times the major objectives of community development, increased production and equitable distribution. The succeeding chapters are concerned with various aspects of this central theme. In the discussion on land policy we set out the lines on which changes in the social structure might be brought about speedily to the greatest advantage of the country while, at the same time, strengthening the village community, eliminating differences in status and opportunity, and building the village into an organic unit in the structure of national planning.

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25. The Five Year Plan envisages substantial increases in agricultural production for foodgrains as well as for commercial crops. The targets proposed in the Plan are to be realised through development programmes relating to major and minor irrigation works, extension of cultivation, reclamation and intensive farming based upon the application of the results of research. Considerable stress is laid on the conservation of existing resources, in particular, of forests and the soil. Diversification and expansion of the rural economy is sought through emphasis on the development of dairying and horticulture and through the growth of village industries, wherever possible, with the aid of power and improved tools. Land resources are to be supplemented by the resources of sea and river and, therefore, the Plan provides for a new and extensive programme for the development of fisheries. As the rural economy has been largely starved of financial resources, a substantial programme for providing finance for agriculture has, therefore, been proposed.

26. Measures envisaged in the Plan in the fields of industry, communications, and social services have considerable bearing on the growth of the rural economy, for they raise its economic potential, bring new resources into action and, above all, alter the *milieu* in which the peasant lives and works. Thus, although agricultural programmes lie at the very centre of the Five Year Plan, they have to be seen in the perspective of a larger plan that comprehends all aspects of national development.

APPENDIX

Crop Pattern (Indian Union)

Crops										Million acres	Percentage of the total cropped area
GROUP I (FOOD CROPS)											
1.	Cereals	.	.	.	.	.	.	.	.	193.04	60.88
2.	Gram	.	.	.	.	.	.	.	.	18.71	5.90
3.	Pulses	.	.	.	.	.	.	.	.	28.47	8.98
4.	Fruits and Vegetables (a)	.	.	.	.	.	.	.	.	5.00	1.58
5.	Other food crops (a)	.	.	.	.	.	.	.	.	1.65	0.52
TOTAL										246.87	77.86
GROUP II (COMMERCIAL CROPS)											
6.	Major oilseeds	.	.	.	.	.	.	.	.	26.68	8.41
7.	Other oilseeds (a)	.	.	.	.	.	.	.	.	4.27	1.35
8.	Cotton	.	.	.	.	.	.	.	.	14.56	4.59
9.	Jute	.	.	.	.	.	.	.	.	1.45	0.46
10.	Other fibres (a)	.	.	.	.	.	.	.	.	1.05	0.33
11.	Sugarcane	.	.	.	.	.	.	.	.	4.21	1.33
12.	Tobacco	.	.	.	.	.	.	.	.	0.90	0.28
TOTAL										53.12	16.75
GROUP III (PLANTATIONS, CONDIMENTS AND SPICES)											
13.	Plantation crops (tea, coffee and rubber)	.	.	.	.	.	.	.	.	1.19	0.37
14.	Conditments and Spices (a)	.	.	.	.	.	.	.	.	2.46	0.78
TOTAL										3.65	1.15
GROUP IV (OTHER CROPS)											
15.	Fodder (a)	.	.	.	.	.	.	.	.	11.17	3.52
16.	Other crops (a)	.	.	.	.	.	.	.	.	2.27	0.72
TOTAL										13.44	4.24
TOTAL CROPPED AREA										317.08*	100.00

Source : Estimates of area and production for 1950-51 in case of all crops except those marked (a). The latter relate to 1949-50 and the source is Land Utilisation Statistics.

*While the estimates for cereals and gram cover reporting as well as non-reporting areas, those for other crops relate to reporting areas only. The total cropped area may, therefore, be somewhat larger.

CHAPTER X

DEVELOPMENT OF THE CO-OPERATIVE MOVEMENT

IN INDIA, as in many other countries, co-operation started as a means of ensuring for the poorly equipped citizens advantages which better placed persons were able to command by their own individual resources. The principle of mutual aid, which is the basis of co-operative organisation, and the practice of thrift and self-help which sustain it, generate a sturdy feeling of self-reliance which is of basic importance in a democratic way of life. By pooling their experience and knowledge and by helping one another, members of co-operative societies cannot only find the solutions of individual problems but also become better citizens. In an unregulated economy, the terms of contract are frequently weighted in favour of persons of large means. Those who have the command of scarce resources are left free to drive a bargain with those who need such resources but are ill-equipped to compete for their possession. In a relatively stagnant agricultural economy of small holders, undergoing a transition from barter to money economy and from local to national and international exchange, the possession of capital naturally confers a strategic advantage. The evils of usury, indebtedness and widespread indigence which were rampant in the rural areas at the turn of the century were the inevitable outcome of the economic transition that was then taking place.

2. After the experience of the limited success of merely regulatory laws like the several anti-usury measures, an effort at building up by mutual association the people's own credit institutions was sponsored by government. In the then prevailing atmosphere of economic passivity on the part of the State this official sponsoring of a special form of organization was considered to be a great event. The first piece of co-operative legislation was the Co-operative Credit Societies Act of 1904, which was amended in 1912 to permit the formation of societies for purposes other than credit. As a result, societies for a variety of purposes began to be organized. This process of diversification was, however, slow in its pace, until the special needs of the period of the Second World War, and the subsequent years of reconstruction invested co-operative organizations with a special importance and significance. When individualism was the order of the day, co-operation represented a defensive act of association on the part of individual citizens. But with the adoption of the principle of social regulation, the cooperative societies, which from their commencement in this country have been socially sponsored and supported, came to occupy more positive role. In a regime of planned development, co-operation is an instrument, which while retaining some of the advantages of decentralisation and local initiative will yet serve willingly and readily the overall purposes and directives of the plan. This has been amply proved by the recent experience of India, as also of other countries, like the U.K. which have entered upon an era of democratic planning. The co-operative form of organization can no longer be treated as only a species within the private sector. It is an indispensable instrument of planned economic action in a democracy.

3. The broad features of the history and evolution of co-operation in India are unmistakable. With 181,000 Societies, a membership of about 14 million and a working capital of Rs. 276 crores the movement constitutes an important economic and social force in the country. It has shown a steady quantitative expansion, especially during the last five years. Even more striking than the expansion in numbers and size, is the growing diversity of functions assumed by co-operative societies. Besides agricultural societies of all types—credit, processing, marketing, farming, irrigation, consolidation, etc.,—there are industrial co-operatives, labour societies, consumers' co-operatives in rural as well as in urban areas, housing societies; processing factories; and urban banks. However, agricultural societies still constitute more than 80 per cent of the total and of these credit societies are still by far the most numerous. The non-credit and the non-agricultural forms are, however, making steady progress. The conditions created by the Second World War, the emphasis on intensive and rapid rural development in the post-war reconstruction programmes of State Governments, and the channelling of state aid activity through co-operative institutions have been responsible for this trend.

4. An increasing measure of responsibility for organising and financing rural economic development is being shouldered by co-operatives. Both the natural evolution of co-operative activity, and the impetus of the special need created in several parts of the country by agrarian legislation regulating the business of money-lenders, scaling down of debts, restricting rents and abolishing landlordism are responsible for the striking increase in the operations of co-operative credit societies. Co-operation is in fact being transformed steadily yet surely, from a tolerated exception into a general rule. In industry, commerce, transport and retail distribution co-operatives are gaining experience and strength. Different State Governments sometimes emphasize different fields of co-operative activity in keeping with local conditions. There can be no doubt, however, that a new awareness of an opportunity to build up a form of business organisation more suited to the conditions and needs of the times than the joint stock company has come over the people of small means everywhere. The joint stock company is too cumbersome as an organization for the small producer, agricultural or industrial. What is needed and what the co-operative society has provided is a simpler form of organization more suited to the needs of the people to be served and therefore likely to be more acceptable.

5. We have in several parts of this report expressed our preference for the co-operative organisation of the economic activities of the people, especially of those activities *e.g.*, agriculture, marketing, cottage and processing industries and internal trade, which form the most important part of the developmental schemes included in the Plan. As an instrument of democratic planning, combining initiative, mutual benefit and social purpose, co-operation must be an essential feature of the programme for the implementation of the Five Year Plan. As it is the purpose of the Plan to change the economy of the country from an individualistic to a socially regulated and co-operative basis, its success should be judged, among other things, by the extent to which it is implemented through co-operative organisations. The Planning Commission in consultation with the State Governments, co-operative organizations, and the Reserve Bank intends to formulate a more specific programme for the expansion of the movement in all the sectors in respect of which co-operative organisation has been considered suitable.

DEVELOPMENT THROUGH CO-OPERATIVES AND PANCHAYATS

6. We are anxious to ensure that in the agricultural part of our Plan the village as a whole should be actively associated in framing targets, in suggesting suitable methods for achieving them, in evolving and directing a suitable organisation for day to day working and in checking periodically the progress made. A willing and constructive participation of the people can alone ensure the success of the Plan. While a general stirring of the aspirations of the people is to be noticed all over the country, the establishment and successful working of village organisations remain to be achieved in many parts. Latterly there has been a welcome earnestness on the part of State Governments for the establishment of Panchayats as civic and developmental bodies charged with the general responsibility of attending to the collective welfare of the village community. Panchayats have an indispensable role to play in the rural areas. As representing the best interests of all sections of the community their status is unique. Many activities such as, framing programmes of production for the village, obtaining and utilising governmental assistance for the betterment of the village, such as, the construction of roads, tanks, etc., encouraging villagers to improve the standards of cultivation, organising voluntary labour for community works and generally assisting in the implementation of economic and social reform legislation passed by the States, will naturally fall within the purview of the panchayat.

7. On the other hand, for the working of individual programmes of economic development, where not only the general interest but also the specific responsibility and liability of a member have to be ensured, a more integrated and binding form of association is needed. Specific and practical tasks of reclaiming land, of providing resources for better cultivation, of marketing the produce of the villagers, both agriculturists and artisans, can be best performed through co-operatives. The co-operative agencies will naturally have to conform to the principles of business management, namely, of satisfactory service and economical working. That they are not profiteering associations and that they function for mutual service makes them desirable agents of democratic planning. It is therefore very necessary that Co-operative agencies in the village should have the closest possible relationship with the principal democratic body namely, the panchayat. Though in the discharge of their functions the two bodies have specific fields to operate, in a number of common functions by having mutual representation and by having common *ad hoc* committees, it will be possible to build up a structure of democratic management of developmental plans through both the organisations, the panchayats and the co-operative societies. We therefore suggest that in so far as institutional reform is an essential part of the implementation of the Five Year Plan, emphasis in due proportion and in appropriate fields should be placed both on panchayats and on co-operative societies.

MULTI-PURPOSE AND CREDIT SOCIETIES

8. The States as a whole are conscious of the importance of developing co-operative societies as a means of re-organisation of rural life. Among co-operative bodies working in rural areas, the multi-purpose society has quite rightly come to occupy an important place. It

has come to be realised that division of the needs, activity and assets of a villager into mutually exclusive parts such as credit, production, sale etc., is some what artificial. At any rate, it has been agreed that for the future an attempt should be made to have in each village a co-operative organisation which will cater for the multiple needs of its members. In some parts of the country efforts are now being made to transform many of the credit societies, which historically have been the most important co-operative organisations, into multi-purpose societies. The emphasis now being placed on the concentrated and all-sided development of rural areas would suggest the desirability of encouraging such transformation. Pending this development the credit societies will continue to play a vital role in rural economy. In fact it is difficult to over-estimate the importance of the services that rural societies could render in the sphere of credit organisation.

9. Recently there has been a noticeable increase of money incomes in the agricultural sector of the economy. Much of the development that will be brought about under the Five Year Plan will strengthen this tendency. While therefore, on the one hand, larger sums will come to be disbursed in rural areas, it is of the utmost importance to see that monies so spent do not go outside the system of organised credit. In other words, rural savings and monies generally in the hands of the rural population have to be kept flowing into credit organisations. A co-operative society is calculated to do this much better than almost any other organisation. In the co-operative form of organization the provision of resources such as credit goes with the practice of thrift. Even if a village co-operative is too small to open a savings account for its members it can induce them either to open accounts with the postal savings banks or the central co-operative banks. It can also function as an authorised agent for savings, promoting savings schemes sponsored by the State or Central Governments. The establishment of credit societies in villages is thus a *sine qua non* of the organisation of credit in the context of planned investment in the developmental schemes approved in the Plan.

10. In the past the village credit societies have been accustomed to secure their finance from central financing agencies operating in urban centres and utilising mostly capital resources made available by the urban classes. In keeping with the normal financial structure an apex co-operative bank has also been established almost in all States. The State Governments have lately taken a more active part in assisting financially the apex banks. The Reserve Bank which as the Central Bank of the country is interested in the creation of a co-ordinated and sound system of rural credit has recently liberalised its procedure for accommodation to co-operative banks. We have ourselves recommended in Chapter XVI that the advances to the cultivators through the institutional agencies (*i.e.* the Government and the co-operatives, the latter with the assistance of the Reserve Bank) should be steadily increased so as to reach the limit of at least Rs.100 crores per annum by the end of the Plan year 1955-56. If, however, the credit structure of the country is to be geared to an increasing pace with economic activity in rural areas an intensive effort at integrating all the channels of credit for the common purpose is needed.

SALE AND PURCHASE SOCIETIES

11. The purchase of the agriculturist's requirements and the sale of his produce are key activities in the business of farming and their importance is likely to be even more crucial in a socially regulated economy. Due to his inability to secure a fair deal at these two stages the average agriculturist is denied the full fruits of his industry. The organisation of co-operative sale and purchase societies and of other marketing organisations is therefore vital both for its direct and indirect benefits. With credit and marketing co-operatively organised all over the country not only would the success of the present initial Plan be more adequately assured but the stage will be set for a much more ambitious and constructive programme of rural development.

12. The emphasis of the Plan is on augmenting agricultural production. In this sphere co-operation has a very significant contribution to make. Co-operatives can help to increase the effectiveness of extension work. Other services which a cultivator needs for efficient utilization of his land can also be made available through co-operative agencies. Such aids as seeds, fertilizers, and implements on which depends the profitable exploitation of the resources of the soil can be effectively placed at the disposal even of the small farmer by co-operative societies. In fact, in the field of agriculture co-operation comprises almost every activity that is connoted by the term agricultural organization. It is the best medium for promoting a progressive agriculture. Major items of agricultural development *e.g.* consolidation of holdings, soil conservation and provision of facilities for irrigation as well as current needs such as protection of crops from pests, diseases and animals can be most effectively served through co-operative organizations.

CO-OPERATIVE FARMING

13. In most parts of the country for ensuring economic cultivation an increase in the unit of cultivation is necessary. Here again, co-operative farming has direct relevance. Without under-mining the sense of proprietorship and the incentive to industry that it gives, co-operative farms can produce all the advantages that a larger unit possesses. A community which has been accustomed to the advantages of co-operative association in other vital matters of its business will be more successfully approached for establishing a co-operative farm than is possible in a community in which co-operation has made little headway. While the controversy between voluntary and compulsory formation of co-operative farms may at this stage be avoided, it can be suggested that in any area where a majority of holders representing at least half of the total area under cultivation desire to establish a co-operative farm, legislative means should be at their disposal to proceed with the formation of a co-operative farming society for the whole village. The State on its part should do everything in its power to encourage the establishment of such farms and to promote their satisfactory working afterwards. Farming through a co-operative calls for a number of individual and corporate virtues on the part of members. It will therefore be some time before co-operative farms reach a developed stage. If during the period of the First Five Year Plan, in representative areas of different States a good number of societies are established as going concerns, we can proceed more confidently to expand that pattern of cultivation in the next Five Year Plan.

CO-OPERATION AND COMMUNITY PROJECTS

14. For the intensive and all-sided development of the villages the community projects have recently been launched in the various States. The purpose and the organisation of these projects have been touched on elsewhere in this Report. We have recommended that in all the aspects of community development co-operative methods of organisation should be adopted to the maximum possible extent. As is obvious, the ultimate justification of community projects will depend on the extent to which the people are enabled to make self-reliant efforts to carry out all their activities in an improved, business-like and progressive manner. While the leadership and assistance of departmental and external sources will to some extent help in initiating the process of community development, for the development to be permanent and expanding the people must be active participants in the whole process. It is not easy to conceive how, in the absence of co-operative organisation of their business and of their social activities, this desirable object of community projects can be realised. While the working of these projects is no doubt likely to vary from area to area in keeping with the local environment, a broad co-operative pattern should be considered essential. As in other spheres of co-operative expansion, the programme of reform should take account of the financial and personnel resources that will be made available by departmental as well as institutional agencies. It is, however, essential that in every community project area a programme for all round co-operative development should be drawn up. The establishment of various types of co-operative societies after educating the local public regarding their benefit will be the best means of enlisting the active support of the people on a voluntary basis for works of improvement on an organized scale.

INDUSTRIAL CO-OPERATIVES

15. In the rural areas the needs of employment will not all be met by farming. The Plan contemplates several improvements such as irrigation, soil conservation, and reclamation which may succeed in giving fuller employment to agriculturists than what they have at present. But limitations of nature will in many instances require that the agriculturists should turn to some other occupations during the slack seasons. Besides these part-time workers there are in the villages several classes of artisans who under the pressure of competition from organised industry are finding it difficult to maintain their traditional employments. Chapters bearing on village and small-scale industries contain recommendations for the solution of problems connected with these classes of the rural population. We have indicated therein the advantage of establishing industrial cooperatives for such workers. While the formation of agricultural co-operatives is by now a familiar experience, industrial co-operatives are still in their infancy. Their activity is so directly in touch with the moving events of a competitive market that the uncertainties of their business often loom larger than their basic importance. Moreover, co-operative financing and marketing agencies have yet very limited experience of doing business with industrial co-operatives. As a result of these factors, the future of industrial co-operatives is yet not so well-established as appears to be the case with agricultural co-operatives. As we have recommended elsewhere, we desire that cottage

and small scale industries should have for themselves well-marked fields which are not encroached upon by large-scale industry. This principle will no doubt have to be translated into more specific and concrete terms as a result of further investigations and experience. When this is done the conditions for the successful operation of industrial co-operatives will be more assured. In the mean while, it is desirable that co-operatives organised for the several trades be established on a sound footing.

16. While it is possible and indeed desirable that the special advantages recommended by us elsewhere should be made available to the members of these co-operative societies, their place in the industrial structure of a planned economy will ultimately depend on their efficiency. Nothing should be done which will undermine the initiative and self-confidence of the members of these societies. Aids in respect of power, implements, raw materials, technical advice and marketing facilities should all be made co-operatively available to these societies. It is not necessary for us in the present context to suggest how the organisation of the industrial co-operatives themselves should develop from the village to the State level. We expect that according to the experience of each State, some form of federal organisation will in due course evolve. But in respect of the capital needs of these co-operatives it must be emphasised that provision for finance will have to be made commensurate with the extent to which the industrial co-operatives are expected to fulfil given targets of production. Whether the existing co-operative financing agencies can continue to offer finance for industrial activities which are somewhat special and, if so, to what extent is a matter in respect of which further enquiry by the States concerned, as also by the Reserve Bank, will have to be undertaken. We note that many of the States are establishing industrial finance corporations, designed for the most part for meeting the financial needs of comparatively small-scale units of industry. The Plan also provides Rs. 15 crores for assisting small-scale and cottage industries. We would recommend that financial aid from this provision and from such corporations should by preference be made available to co-operatively organised industries. With artisans' industry co-operatively developed and with a number of processing factories established on a co-operative basis, a growing portion of rural economic activities will come within the co-operatives sphere. For reasons mentioned earlier in this chapter, such development will conform to the requirements of democratic planning and will make it possible at later stages of planning to formulate more comprehensive schemes of economic progress.

URBAN CO-OPERATIVES

17. While in the immediate future extension of co-operation is most urgently called for in the rural area, where agricultural operations play a dominant part, the urban sector of the co-operative movement has also to develop along systematic lines, if in due course it is to make its contribution to planned development. In urban areas there are a number of artisans of small means who find it difficult to organise themselves in keeping with the requirements of modern times. It is to be desired on social as well as on economic grounds that members of this class should be enabled to reorganise themselves to be able to take full advantage of

modern scientific methods. Small industries co-operatively using advantages like power and special techniques will be able to make a significant contribution to the industrialisation of the country. We have elsewhere expressed our preference for a decentralised type of industrialisation and how far we can go in the direction of decentralisation without loss of economic advantage will depend to a very large extent on the capacity of artisans to organise themselves on a co-operative basis. The utility of co-operation in the urban areas extends to the credit and other needs of small entrepreneurs and cottage workers. Urban banking conducted on co-operative lines has a very important role to play in this field. Co-operative banks are more democratic and more amenable to local control than even small sized joint stock banks, and hence urban banking closely associated with other forms of urban co-operation ought to be more purposefully developed.

18. In urban areas special importance must be attached to consumers' co-operatives. Unfortunately, we notice that as yet, the development of consumers' co-operatives has not made enough progress in the country. Under the influence of rationing and governmental distribution of scarce goods, a number of consumers' societies have no doubt come into being. They have, however, as a class failed to extend their usefulness beyond these limits. Their future, therefore, in the event of removal of controls on distribution of essential articles is somewhat uncertain. The success of consumers' co-operation will primarily depend on the enthusiasm and preference that the co-operators themselves succeed in creating among their fellow citizens. It should, however, be possible for the State to adjust its policies in such a way that the legitimate interests of consumers' co-operative societies are not ignored by those departments of the Central and State Governments which have to attend to their claims. It would in our opinion be in the best interest of the planned development of distributive trades that an attempt be made to build up consumers' co-operatives over as wide a field of distribution as possible. Here again, the questions of finance and credit are likely to be very important. We must, however, remember that to the extent to which co-operatives replace private business, capital engaged in the latter will tend to be released. If a common credit policy is made effective for all credit agencies a transfer of functions will gradually but effectively bring about an appropriate transfer of financial resources.

19. A problem of urban areas in regard to which co-operation has a special significance has been touched upon by us in our chapter on housing. While it is not necessary in this place to cover the same ground again, it must be stated that with the strong urge towards urbanisation that industrialisation is bound to promote, housing assumes crucial importance. While institutional activity such as that undertaken by governmental departments, civic bodies and employers' associations, will meet the situation to a certain extent, a considerable burden of the construction of houses, especially for the middle and lower income groups, will fall on their own co-operative organisations. From the choice of a site to the letting out or use of house-room when it is ready, the work of these housing societies will impinge on a number of departments. It should be the policy of these departments to assist in the formation and progress of these societies.

IMPROVEMENT OF PERSONNEL

20. The success of co-operatives ultimately depends upon their ability to perform their functions—whether they relate to production, finance, marketing, distribution or construction—efficiently and to the satisfaction of the members and the community. The loyalty of the members can be retained not on the basis of monopoly, agreements or under duress but on the strength of the goodwill secured by rendering service. A unit of business, whatever its form, cannot survive if it does not perform properly the tasks which it undertakes. It also ceases to grow if the management is not watchful for new opportunities. In the agricultural sector for instance diesel engines and electric motors are being increasingly used for providing irrigation in some areas while in others tractors are utilised for cultivation and reclamation. A progressive co-operative, besides supplying seeds, fertilisers and other requisites, would provide spare parts, repair and servicing facilities at reasonable cost. These and similar measures in other fields can be adopted only if the staff consists of competent and trained men. Co-operatives are sometimes organised and administered by those who lack both the qualifications and the experience necessary for the job. This factor alone accounts for a large number of failures and the uneven development of the movement in the country. The importance of efficient management cannot, therefore, be too much stressed. Being a movement essentially dependent on the ability of persons in humble walks of life, who are often amateurs in the handling of business operations, the need for training and education is greater than for those who have ample resources and business experience. The co-operative society is, besides a democratic body, each member of which is equally important. Hence the need, recognized from the earliest days of the movement in foreign countries, for diffusing knowledge of the principles and practice of co-operation among all ranks of co-operators.

21. Many of the managerial and supervisory functions call for specialised knowledge and technical skill. The co-operatives ought to recruit qualified men and get the existing staff adequately trained. The present facilities for the training of higher personnel are not adequate and we have provided a sum of Rs. 10 lakhs for their improvement. We also trust that the State Governments will arrange for the training of other staff, and of workers for the co-operative movement.

22. Even though almost all the States have a co-operative department, many of them have to be helped to equip it to shoulder the new, diversified and complex responsibilities now envisaged. Until recently the main statutory functions of the department were registration, audit and inspection. Consequently the bulk of the staff was well versed in these activities. Now that the co-operatives are being recognised and utilised as an important instrument of economic planning, the staff of co-operative departments, without spoon feeding or interfering too much in the working of the Societies, should be able to provide effective guidance and knowledge and not merely be auditors and inspectors of the Government. In short a constructive attitude and determination to make a success of the co-operatives must pervade the Government departments and the people.

FUTURE POLICY

23. In the past there have been occasional complaints to the effect that while the State generally sponsors co-operative societies and desires to accord them a preference, in actual practice agencies other than co-operatives often receive better treatment from a number of departments. There is also a tendency, in some of them, to regard only the co-operative department as responsible for co-operative development. It has already been indicated that the various forms of co-operative activity impinge on a number of departments. Therefore, unless every department and every Ministry accepts and adopts the policy of fostering co-operative methods of business, rapid and enduring results cannot be obtained. For instance the Central and State Public Works and Irrigation Departments spend fairly large amounts on works programmes every year. Except in one or two States most of the works are entrusted to contractors. We consider that every department should follow the policy of building up co-operatives which may eventually replace the contractors or other middle men. It is, however, not our intention that co-operatives should be bolstered up indefinitely, irrespective of the quality or cost of the service they offer. At the same time it is only reasonable to expect that in their formative years they should be ungrudgingly helped by the State to utilise the opportunities offered to them and enabled to consolidate their strength.

CHAPTER XI

FOOD POLICY FOR THE PLAN

BASIC CONSIDERATIONS

A WELL-DEFINED food policy for the period of the Plan is an essential condition for the successful implementation of the Plan. For the large sections of the community which live near the margin of subsistence, a certain minimum supply of foodgrains at reasonable prices constitutes the rock-bottom of the standard of living, a fall in which would be seriously detrimental to health and efficiency. The consequences of any untoward development in the food situation are too obvious to need stressing. The experience of the last few years has brought out clearly the vulnerability of the economy on account of the inadequate production of foodgrains in the country. Foodgrains occupy a pivotal place in the price structure, and if this latter has to be safeguarded, as it must be, the prices of foodgrains must be held stable at levels within the reach of the poorer sections of the community. Even a moderate shortfall in the supply of foodgrains is likely, under Indian conditions, to raise their prices more than proportionately, and a rise in food prices leads directly to a rise in the cost of living and in production costs, all round. This does not, of course, mean that the producer of foodgrains should not get a reasonable return. On economic as well as social grounds, it is vital that he does. But, the real return that he gets does not depend only upon the prices he obtains for his produce ; it depends as much upon the prices he in turn has to pay for what he buys. If an increase in food prices raises these latter, he may be no better off in the end, and may even be worse off. In the last analysis what limits the real income of the primary producer is low productivity. To increase this latter, what is needed is a programme of public investment which will give him the water, the power, the seeds and the manures he needs. A policy which might raise prices all round and jeopardise the investment programme itself is, therefore, of no ultimate benefit to the producer. Food policy for the Plan has, therefore, to keep in mind these wider considerations.

2. The food problem has been the subject of discussion and debate for more than a decade, and several expert committees have reported on the various aspects of the problem. The Bengal Famine Commission reviewed in detail the long-term trends in the economy as well as the several short-term factors which culminated in the food crisis of 1943. The report of that Commission enunciated the principle that "food for all" must be accepted as the basis for Government policy in this field. In a planned economy, this objective inevitably acquires added importance and has to be effectively implemented. The system of controls developed since 1943 through a process of experimentation and of adjustment of the needs and claims of the various States, surplus as well as deficit, has had as its objective the

mobilisation of available food surpluses in the country and their equitable distribution at reasonable prices. The operation of this system has meant a strain on the administration ; it has often involved difficult decisions affecting one sectional interest or another. The degree of public co-operation necessary for ensuring the success of such a system of controls has not always been forthcoming, and doubts have from time to time been expressed whether, on balance, there was advantage in such a system, or whether it might not be better to revert, at least in some degree, to the traditional organisation of the free market and the operation of the impersonal laws of demand and supply. And yet, the lesson of experience is unmistakable : the free market is not a dependable mechanism when the economy is or is likely to be under pressure due either to short supplies in the country or unfavourable developments abroad. It is not without significance in this context that most proposals for decontrol and the restoration of the free market visualise certain safeguards like cheap grain shops, licensing of traders, requisitioning of stocks if necessary, etc. But, these forms of control were tried in the early stages, and it was because they proved unsatisfactory that more stringent controls involving procurement, restriction of movements, price control and rationing had to be adopted.

3. The fact that food controls were a product of war-time scarcities is apt at times to obscure the role they have to play in a planned economy. A plan for development involves large outlays on investment, and this, in the early stages, increases money incomes faster than the available supplies of consumer goods. The pressure of these money incomes, especially if they accrue to the less well-to-do classes, is bound to be felt chiefly on foodgrains, with the result that if the prices of foodgrains are allowed to rise, the real income of these classes is likely to rise much less than their money incomes, thus depriving them of the beneficial results of increased employment and incomes. Nor are these adverse effects confined to the new recipients of income ; they affect all fixed income earners who may be subjected through these price increases to ' forced saving ' out of proportion to their capacity. In a planned economy, food controls have thus certain positive functions, such as safeguarding the minimum consumption standards of the poorer classes, preventing excessive or ostentatious consumption by the well-to-do, and facilitating the country's programme of direct utilisation of unemployed manpower for investment.

THE DEFICIT

4. A major question that arises in this context is as to the precise measure of the ' deficit ' in foodgrains the country must provide for. For this purpose, it is necessary to assess the trends in production and to see how they compare with requirements. We have given careful consideration to this question, but we find that on the basis of available data, it is not possible to reach any definite conclusions on this point. Official figures regarding

acreage and production prior to 1949-50 are not comparable with those for earlier years on account of changes in coverage, mergers of States, etc. The figures of production since 1949-50 indicate, as will be seen from the table below, no significant trend :—

Foodgrains Production, 1949-50 to 1951-52*

					(in million tons)			
					Rice	Wheat	Millets	All cereals
1949-50	.	.	.	.	22.8	6.5	16.2	45.5
1950-51	.	.	.	.	22.1	6.7	15.4	44.2
1951-52	.	.	.	.	22.8	6.2	15.4	44.4

From an analysis of official figures it appears that there are large variations in the availability of foodgrains between various States, and considerable variations from year to year within the same State. To some extent, these variations might be indicative of the imperfection of the data themselves, but it is clear that an estimate of the 'deficit' arrived at on the basis of an average form of requirements for the entire country is apt to prove wide of the mark.

5. Apart from the fact that it is not possible from available data to say how much precisely is the total food production in the country, there is also some doubt whether these data could safely be used for framing a judgment as to whether or at what rate food production in the country has been increasing. There is a view that foodgrains production is, in fact, significantly larger than is indicated by official figures. Certain data bearing on production and consumption of foodgrains have been compiled in connection with the National Sample Survey, and these may be expected to throw further light on the subject. For the time being, the official data, which represent information collected on a countrywide basis and over a continuous period of years, have to be used, though with due caution, for framing policies and for carrying on administration at different levels in the sphere of food and agriculture.

6. From a practical point of view, it is of no great consequence whether food production is or is not higher than is shown by the official data. For, if more is being produced, more is being consumed also. What matters for practical purposes is that over the last six or seven years, the country has imported on an average about 3 million tons of foodgrains. The following table gives these imports since 1946 :—

Imports of Foodgrains, 1946-1952

								(in million tons)
1946	.	.	.	.	.	.	.	2.25
1947	.	.	.	.	.	.	.	2.33
1948	.	.	.	.	.	.	.	2.84
1949	.	.	.	.	.	.	.	3.71
1950	.	.	.	.	.	.	.	2.13
1951	.	.	.	.	.	.	.	4.72
1952	.	.	.	.	.	.	.	3.90

*Official figures as corrected in the light of the results of I.C.A.R. sample surveys.

Imports of foodgrains were lowest at 2.13 million tons in 1950, but this low level of imports necessitated a reduction of 0.85 million tons in the stocks held by Government. Taking into account imports as well as changes in stocks, the net absorption of foodgrains from abroad for the last few years has been as follows :—

						(in million tons)
1947	.	.	.	.	.	2.8
1948	.	.	.	.	.	2.4
1949	.	.	.	.	.	3.2
1950	.	.	.	.	.	3.0
1951	.	.	.	.	.	4.1
1952*	.	.	.	.	.	3.4†

Average net absorption for these years works out at 3 million tons ; the minimum being 2.4 million tons in 1948, and the maximum being 4.1 million tons in 1951. While it is not possible, as stated above, to estimate the ' deficit ' directly in terms of food production and requirements, this net absorption of imports is indicative of the measure of deficiency that has to be made good. In the nature of things, the ' deficit ' is not an invariable factor. If food prices are allowed to rise, the consumption of some sections of the population would come down for want of sufficient purchasing power to buy food at these prices. Through such cuts in consumption, the supplemental imports needed from abroad could be reduced, but this would involve serious hardship, which might even react on productive efficiency.

7. It would be wrong at the same time to take a static view of the ' deficit '. Population in India has been increasing at the rate of about $1\frac{1}{4}$ per cent. per year, and the additional annual requirements needed on this account are of the order of 4 $\frac{1}{2}$ lakh tons. This means that over a period of five years an increase of about 2 $\frac{1}{4}$ million tons in foodgrains production would be absorbed by the increase in population. The problem thus is of providing for an increasing population, if and to the extent possible, at more satisfactory levels of consumption.

8. The ' deficit ' in foodgrains works out roughly at about 6 to 7 per cent. of production as judged from official figures. In view of the possibility of these figures being under-estimates, the actual deficit might be lower, say, about 5 per cent. of total production. While, for the reasons mentioned earlier, a marginal addition to available supplies may prove under present conditions of more than proportionate benefit, the aim of policy must be to increase domestic production, to secure an increase in the marketable surplus, to distribute the same as equitably as possible, and to eliminate by the end of the Plan period the need to import foodgrains. It might be well to stress in this connection that the need to import from abroad is related more directly to the marketable surplus available for meeting the requirements of non-food producers than to total production, and that the problem is not merely one of increasing production but also of mobilising more effectively the surpluses which become available with the producers.

*Approximate.

†As a result of the relaxation of procurement in the latter part of the current year, it is possible that some stocks will be available with private trade for carryover to the next year. But data regarding these are not available.

9. The total cost of imported grains since 1948 works out at over Rs. 750 crores. Although part of the imports received in 1951-52 were financed out of the U. S. wheat loan, it cannot be questioned that the country has been paying heavily for these imports. Any change in food policy likely to reduce procurement and increase the dependence on imports, which, in turn, might mean further expenditure on subsidies, has therefore to be avoided. In fact, the aim should be to reduce imports progressively. The optimum utilisation of the resources available to the country demands that for meeting the requirements of the food administration, the system of internal procurement must not only be maintained but must be steadily improved.

10. For the immediate future, relative scarcity of foodgrains has to be regarded as a datum. The review of the Grow More Food campaign since 1943 undertaken recently by the Grow More Food Enquiry Committee brings out the fact that there has been in recent years an addition to the "production potential" in the country through schemes of minor irrigation and land improvement. It is also true that the efforts made under the campaign have created a new consciousness among agriculturists as to the need and scope for improved agriculture. The reorientation of the campaign suggested by the Committee and the schemes for agricultural development included in the Five Year Plan will undoubtedly show results. It may be hoped that when these results come, they will come cumulatively. The point, however, is that it will be some time before the new trends are established. So far as the outlook for the immediate future is concerned, a particular year might turn out to be on the whole satisfactory, but food policy must, if serious risks in a vital matter like food are to be avoided, be based on the assumption of a continuance of the condition of relative scarcity and strain in spite of a progressive increase in production. This means that for the period of the Plan, rationing and procurement together with certain minimum imports, must be regarded as the key to the maintenance of a stable system of food controls.

FOOD PRICES

11. The following table brings out the trends in wholesale prices and in cost of living since 1947 and shows also the indices for cereals in relation to these—

	Whole- sale prices (General index)	Cereals	Wheat	Rice	Food articles	Cost of living (Bombay General)
November, 1947	302	317	375	336	295	273
July, 1948 .	390	478	720	500	392	297
March, 1949 .	370	467	748	486	377	296
September 1949	390	464	557	501	403	291
April, 1950 .	391	458	518	500	399	292
April, 1951 .	458	490	560	555	413	319
December, 1951	433	464	524	539	399	315
March, 1952 .	378	442	510	519	343	298
June, 1952 .	375	445	529	520	350	322
September 1952	389	459	555	543	368	325
October, 1952 .	388	442	556	527	358	...

The rise in wholesale prices as a result of decontrol in 1947 was as high as 30 per cent. After the reimposition of controls in 1948, a measure of stability was attained until the devaluation of the rupee along with several other currencies in September, 1949. The anti-inflationary programme taken in hand soon after devaluation was again a stabilising factor. Prices rose sharply after the outbreak of the Korean War, and although steps were taken to prevent money income from rising as a consequence of the abnormally high prices of exports, the economy was once again subjected to serious inflationary strain. The rise in prices in India was less than in the U.K. and the U.S.A. and a considerable part of it was due to speculative factors. The subsequent decline in prices in India was partly a corrective to the earlier speculative trend, and partly a consequence of the real change in world demand-and-supply conditions and of the adoption of disinflationary monetary and fiscal measures by the Government. The inflationary pressures associated with the Korean War have thus been neutralised during the last 12 months or so. But it is evident from the price trends in the last five years that the ground lost in 1947-48 was never regained. The present high level of cost of living is causing serious hardship to the middle classes and it is necessary to safeguard their legitimate interests. The need for a disinflationary price policy, therefore, remains.

12. The decline in wholesale prices since the break of the Korean War boom in April 1951 has been about 15 per cent. The largest fall has occurred in the case of industrial raw materials, which have gone down by 34 per cent. Food articles have registered a fall of 13 per cent., but the fall in the price of wheat and rice has been of the order of only 1 per cent. and 5 per cent. respectively. The general index of wholesale prices is now at about the same level as on the eve of the Korean War, and the index of food articles is about 10 per cent. lower. But it must be noted that it is the prices of food articles other than wheat and rice that have fallen. The index for wheat now stands at 556 as compared to 518 in April 1950 and is close to the peak level of 560 reached in April 1951. The continued high level of the prices of basic cereals accounts largely for the failure of the cost of living to come down.

RECENT CHANGES IN FOOD CONTROL

13. The large imports of grain in the latter part of 1951 and the early part of this year improved substantially Government's stock position in foodgrains. In March and April this year the low price of oilseeds and the difficulties in the disposal of cotton probably compelled farmers to sell more grain in order to meet their cash requirements. To some extent, the bearish psychology created by the sharp fall in almost all prices in the first few months of this year was also responsible for some dehoarding of grains. The satisfactory procurement in the first half of this year, the accumulation of stocks with the Government and the decline in offtake from ration shops led to relaxations of control in several States in June and July. In Madras statutory rationing was withdrawn as from the 15th of June and cheap grain shops were opened instead. Procurement was temporarily discontinued. The State was divided into six zones and inter-district movements within these zones were

permitted. Thereafter, statutory rationing has been suspended in Bihar, U.P., Hyderabad, Mysore, Saurashtra and Madhya Bharat and inter-district bans have been lifted or modified. These changes must be viewed as changes in food administration in response to changes in circumstances. The basic policy of keeping down food prices to a reasonable level and of ensuring that the available supplies of foodgrains are mobilised effectively for meeting the needs of the vulnerable sections of the community must remain unchanged. Only when a substantial and enduring improvement in domestic production and marketable surpluses has materialized can change in basic policy be considered.

14. Between June and October 1952, stocks of foodgrains with the Central and State Governments came down by about 1·1 million tons. The year is, however, expected to close with stocks of about 1·8 million tons, which represents the highest level reached since the imposition of controls. The arrangements in regard to imports, domestic procurement and distribution for 1953 must, in our view, aim at a carry-over of between 1·5 and 2 million tons at the end of the year. A carry-over more or less of this order might be considered necessary for the entire period of the plan.

15. The period since relaxation of controls has been too short to warrant any definitive judgment as to the effects of such relaxation. Short-period movements in prices are inevitably subject to various influences, seasonal and others, which might not be of significance in the long run. These trends have, however, to be carefully watched, and the machinery of basic controls has to continue to operate so as to check any undesirable developments.

16. In regard to millets, certain changes have recently been made in the system of controls with a view to stimulating freer movements within States and larger flows from the surplus States to deficit States. Inter-State movements as well as prices at which the deficit States buy from the surplus States will continue to be controlled by the Central Government. The index of jowar prices in September this year was 204 as compared to 382 towards the end of 1951. It is also significant that throughout the period of controls the prices of millets have risen much less than those of wheat. A measure of relaxation in respect of the internal movement of millets, subject to inter-State bans being maintained and buying by deficit States being kept under Central regulation, may thus be expected to ensure a better distribution of these grains as between States, without producing direct repercussions on major cereals. With buying by deficit States under regulation, prices can be prevented from rising too much, and the retention of inter-State bans ensures that any undesirable developments can be checked in time through appropriate administrative arrangements. The administration of controls is a complex matter, and a measure of experimentation in regard to the detailed arrangements to be made, subject, however, to certain essential safeguards, is desirable if excessive rigidity is to be avoided.

FOOD CONTROLS IN RELATION TO THE PLAN

17. If "food for all" is to be the effective basis of policy and if the investment targets in the Plan are to be adhered to, the basic structure of food controls has to be kept intact during the period of the Plan. It is our considered view that until the domestic production

of foodgrains has been stepped up to the extent of 7.5 million tons as envisaged in the Plan, the country cannot be considered to have an adequate and assured food supply. Controls might be relaxed or their form altered after the target of additional production has been achieved and adequate transport facilities have been created to ensure the expeditious movement of foodgrains from one part of the country to another. The extent to which such relaxation or changes could be made will depend upon the investment targets that the country might then have, and the alternative demands for additional production of raw materials like cotton, jute and oilseeds.

18. It is sometimes argued that controls act as a disincentive to production and that if free market conditions are restored, production will be stimulated, and even though prices rise in the process, the consumers will, in the long run, stand to benefit. To what extent controls are a disincentive depends on two factors, (a) the prices paid to producers for controlled commodities, and (b) the efficiency and fairness with which the controls are administered. This latter aspect of the problem has, of course, to be constantly kept in view. As regards prices, the problem is to define a level which may be considered reasonable under given circumstances, and to ensure through direct controls or through fiscal and other devices that the producer of foodgrains is not placed at an undue disadvantage. The difficulty about the incentive which might be given by the unregulated operation of the free market to production in a particular line is that expansion in this line takes place at the expense of output in some other line. A general increase in output cannot, obviously, be secured by merely increasing the money reward for each unit of work. The great advantage of a system of controls is that under it the measure of incentive to be given can be regulated.

19. A policy of price stabilisation must have in view certain maxima as well as certain minima. At a time when the economy is subject to inflationary pressures, the emphasis is inevitably on the maintenance of the maxima. But if the trend of prices is persistently downward, a system of controls with defined procurement prices can be used—and indeed should be used—to safeguard the interests of producers by preventing prices from falling unduly. Judicious purchases by Government at defined prices are thus an excellent device for stabilising prices and for evening out to some extent inter-State disparities. Elsewhere in this Report, we have stressed the desirability of initiating State trading in a few essential commodities to begin with. With the bulk of the trade in grains already in the hands of Government, further extension of such trading can play a vital part in stabilising or reducing the cost of living and in diverting to the public sector the surpluses which might accrue in those lines.

20. Food policy has a direct bearing on the investment programme which can be undertaken in an underdeveloped economy. The larger the available supplies of food, the more effectively they are mobilised, the greater is the investment effort the community can put forth, for food constitutes the wherewithal for sustaining the labour force employed in construction and in the production of capital goods and equipment. The rapid

development of an underdeveloped economy is a function mainly of the rate of capital formation, and the latter can be stepped up as more food can be made available to the newly employed. The Five Year Plan, as it now stands, envisages a stepping up of total investment in the economy from about Rs. 450 crores in 1950-51 to about Rs. 675 crores by 1955-56, which amounts to an increase of 50 per cent. in the course of five years. The yearly rates of investment are thus high enough to call for special effort. The resources available to the public sector for financing its plan of Rs. 2069 crores are estimated, as has been shown in Part I, to necessitate a considerable measure of deficit financing. If economic activity in the country is stimulated, as is proposed under the Plan, incomes in the country-side must increase. This is bound to ensure a high level of demand for food. In fact, it may even be stated that a development plan which does not raise the demand for food in the country significantly must be considered inadequate. Persistently low or falling food prices under present conditions of domestic production and availability can only indicate insufficient investment effort and low purchasing power in the community.

21. Throughout this Report, we have emphasised the need for utilising unemployed manpower more effectively. It is only through such utilisation of idle manpower and the spare hours of those partially employed that a comprehensive programme of development can be implemented. The low levels of employment which have become endemic in the economy are not merely so much economic waste; they constitute a big social problem involving the very stability of the economic and social system. The rate at which the unemployed can be absorbed in productive work depends, obviously, on Government's capacity to supply them food at reasonable prices. It is true that even the unemployed do in any case consume food, but this only means that the increase in food requirements need not be proportionate to the increase in employment. On the other hand, it has to be borne in mind that when the unemployed are put to work, firstly, their food requirements are likely to go up and, secondly, the necessary supplies will have to be found not directly from the families which were hitherto supporting the unemployed but from the marketable surplus available in the system.

22. There are parts of the country which are subject to periodical droughts and scarcity. Some areas are so underdeveloped and yet so thickly populated that special efforts are necessary to create new avenues of employment for the people in these areas in order to provide them with the minimum purchasing power necessary for sustenance. It is in this context as much as in the larger context of development that deficit financing on a big scale is often advocated. What limits the measure of deficit financing that can be undertaken under such conditions is not finance as such but the danger of larger money incomes generating inflationary pressures which might affect adversely the economy as a whole. Only to the extent that these latter are controlled and the supply and distribution of food-grains and other essential commodities at reasonable prices arranged can deficit financing for fuller employment be safely proceeded with.

RATIONING AND PROCUREMENT

23. The system of food controls to be maintained has to be related to the needs of the urban and other highly deficit areas. This means that cities and towns above a certain size—which might vary according to local conditions in each State—must be statutorily rationed and the needs of highly deficit areas like Travancore-Cochin must be similarly looked after. A system of controlled distribution through non-statutory rationing should normally be adequate for other area.

24. The system of procurement to be adopted must aim at channelling into the hands of the official agency the surpluses available in each State after the needs of the local population are provided for. Whether monopoly procurement or some form of levy would best answer the purpose has to be determined in the light of the conditions prevailing in each State. The aggregate requirements of the Central and State Governments for meeting their commitments have, since the restoration of controls towards the end of 1948, been between 7 and 8 million tons. These have been met through domestic procurement amounting to between 3·8 and 4·6 million tons and imports varying between 4·7 and 2·1 million tons. Of the total procured domestically, Madras and Bombay which are net importing States have been responsible for about 40 per cent. It will be noticed that the net exports from surplus States have been small relatively to total procurement, the maximum attained being 785,000 tons in 1950. In 1951, net exports from these States fell to 170,000 tons, and for 1952, they amounted 350,000 tons up to the end of October. If food controls are to function with increased efficiency, it is necessary to evolve a system which will increase the flow of grains from surplus States. For deficit States, the problem is to secure from local production what they need for meeting their commitments without, on the one hand, reducing unduly the availability of grain in the rural areas, and, on the other, increasing the demands from the central pool.

ADMINISTRATION OF FOOD CONTROLS

25. The maintenance of a satisfactory system of food controls depends upon : (a) clarity and continuity in policy, (b) efficiency in administration and (c) the degree of public co-operation that can be secured. The last is, to a great extent, dependent on the first two. As regards policy, the question has to be approached not so much from the point of view of the needs of particular States as from the overall national point of view. In a country of the size and diversities of India, there is room for differences in the details of administrative arrangements. It is necessary in these matters to adopt a pragmatic rather than a doctrinaire view and to leave room for local adaptations in the light of prevailing circumstances. Nevertheless, the broad objectives must be kept clearly in mind. The aim of policy must be to secure from each surplus State the maximum it can make available to the common pool and to organise the procurement and distribution of grains in each deficit State so as to restrict its drawings from the central pool to the minimum necessary. It is evident that the responsibility for fixing procurement and issue prices and for co-ordinating the control policies of States must rest with the Centre.

26. The maintenance of a system of controls presupposes efficient administrative arrangements. Given the essential framework of policy and the determination to pursue certain objectives steadily, the necessary efficiency in administration can be secured. Planning implies the readiness to undertake new and onerous responsibilities, and to argue for decontrol on the ground of administrative difficulties is to question the feasibility of planning. A solution to such shortcomings and difficulties has to be found through progressive improvement of the administrative machinery. To a great extent, this is a question of selecting the appropriate personnel.

CHANGE IN FOOD HABITS

27. Finally, we should like briefly to touch upon an important aspect of the food problem which relates to consumption habits. Of all the foodgrains which form the staple diet of the country, rice presents special difficulties. Not only India but the world as a whole is short of rice, and the world price of rice is high and is rising further. Even a moderate import of 500,000 tons of rice is estimated to involve an expenditure of about Rs. 40 crores. The outlook for wheat is, on the other hand, better. Considering these circumstances, the substitution of wheat for rice to a moderate extent in the customary diet is highly desirable. The shortfall in the country's rice production is not more than 2 or 3 per cent. of total needs, and it should by no means be difficult to make good this deficiency by substituting wheat for rice. There is also scope for encouraging the use of supplementary foods. No doubt, food habits are not easy to change, but if the public is made aware of the cost involved as also of the undoubted benefits of a more varied diet, the necessary response could be secured.

CHAPTER XII

LAND POLICY

THE LAND PROBLEM

THE FUTURE of land ownership and cultivation constitutes perhaps the most fundamental issue in national development. To a large extent the pattern of economic and social organisation will depend upon the manner in which the land problem is resolved. Sooner or later, the principles and objectives of policy for land cannot but influence policy in other sectors as well.

2. In the three preceding chapters, we have set out at some length the state of the agricultural economy, the approach to agricultural development in relation to the process of national development as a whole, and, finally, the practical implications of the food problem. In this chapter and the next we consider what may be described as the social policy for bringing about those changes in the pattern of production and distribution and in the structure of the rural economy which will serve to establish increasing equality of status and opportunity and, at the same time, help fulfil the targets of agricultural production which are central to the success of the Five Year Plan. In other words, from the aspect of the national economy as a whole, the conclusions to be emphasised are:—

- (1) increase of agricultural production represents the highest priority in planning over the next few years; and
- (2) the agricultural economy has to be diversified and brought to a much higher level of efficiency.

From the social aspect, which is not less important than the economic, a policy for land may be considered adequate in the measure in which, now and in the coming years, it reduces disparities in wealth and income, eliminates exploitation, provides security for tenant and worker and, finally promises equality of status and opportunity to different sections of the rural population.

3. The achievement of these economic and social aims is as much a part of the purpose of the Five Year Plan as the fulfilment of targets in industry or transport or agriculture. While broad principles and directions of policy can be indicated, it is necessary to remember that the form and manner of their application and the adaptations to which they are subject will differ widely in different parts of the country. In the main, land policy has to be worked out in terms of local needs and conditions. The texture of relationships concerning land, conditions of economic life, the social composition of rural communities and the pattern of occupational distribution differ widely, so that no generalisation can have more than a limited

value. Nevertheless, developments in one State are often significant enough to exert influence elsewhere. On account of the abolition of feudal tenures, which is in progress in many States, the system of land holding over the greater part of the country is beginning to approximate in substance to the *ryotwari* system. Proposals for land reform raise important questions of policy and finance which call for close co-operation and consultation between the Central and State Governments. Even though the pace of land reform and of economic development cannot be the same all over the country, it is desirable that as between different States there should be a broad, common approach in land reform programmes and, as an essential aspect of the implementation of the Five Year Plan, the stages in which land reforms are to be carried out should be worked out by the Central Government and the States.

4. Problems of land reform may be viewed in two ways, namely, (i) from the point of view of agricultural production and (ii) from the point of view of different interests in the land. The first aspect is the subject of land management legislation, the second of land reform legislation. To fulfil its broader objectives, land policy should include both elements, for, it is only in an economy in which production and employment expand that the community can realise fully the benefits of changes in the social and economic structure. Although, between the two aspects of policy, there is no conflict of principle, land reform will be fruitful in the measure, in which each step is marked by a balance of emphasis. The main outlines of policy have to be conceived in terms of different interests in land and, at the same time, the effects on production of each measure that may be proposed have to be foreseen and provided for. The interests in question are: (1) intermediaries, (2) large owners, (3) small and middle owners, (4) tenants-at-will and (5) landless workers. These different interests cannot be considered in isolation from one another, for, any action affecting one interest must either give something to or take something away from one or more of the other interests. As social and economic adjustments affecting individual interests come into effect, a new social structure takes the place of the old. It is best that the period of transition and uncertainty should be short, so that the new social pattern can develop its own organic unity and can begin to evolve from within.

INTERMEDIARY RIGHTS

5. The abolition of intermediary rights has been the major achievement in the field of land reform during the past few years. In varying degrees these rights had a long history behind them and, until quite recently, in some States, they were the essential elements of power in the feudal structure. As a result of the elimination of these rights, in States which had *zamindari*, *jagirdari* or other similar tenures, the State has now come into direct contact with the occupier of the land. *Zamindari* has been abolished in Uttar Pradesh, Madhya Pradesh and Madras and is in the process of abolition in Bihar. Legislation already enacted in Assam and Orissa is shortly expected to be enforced, and West Bengal, which has had serious problems to reckon with since Partition, is engaged in framing legislation for the abolition of *zamindari*. Legislation for the abolition of *jagirdari* has been enacted in Rajasthan, Madhya Bharat, Hyderabad and Saurashtra and also in some of the smaller States in Central

India. It has not yet come into effect, however, except in Hyderabad and Saurashtra. In States such as Bombay, Punjab and PEPSU, elements of superior rights which existed have been eliminated or are in the process of being eliminated. The amendment of Article 31 of the Constitution in 1951 cleared the way for the completion of these reforms.

6. Although the abolition of intermediary rights can be described as the completion of one important phase of land reform, two principal problems have not yet been fully solved. These relate to (1) payment of compensation to *zamindars* and *jagirdars*, and (2) establishment of the necessary revenue administration. In a number of States compensation is expected to take the form of non-negotiable bonds carrying a rate of interest and repayable within a period which may extend to 40 years. The question arises whether the compensation to be paid could serve to some extent as a source of investment in public enterprises. One suggestion which has been made is that the bonds issued to *zamindars*, while they remain non-negotiable for periods to be indicated, might be made convertible into shares in projects undertaken by the State Governments concerned or even by the Central Government. The arrangement may have certain advantages both from the side of Government and from the side of the person who converts his compensatory bonds into shares in public enterprises. The suggestion, however, needs to be further examined with reference to conditions in the principal States in which *Zamindari* has been or is expected to be abolished.

7. The question of revenue records and revenue administration in *Zamindari* and *jagirdari* areas is of paramount importance. From information which has been collected from a number of States, it is apparent that the subject needs urgent attention. In the temporarily settled areas, there has long been a framework of revenue administration which, if strengthened, will be capable of assuming new responsibilities consequent upon the abolition of *zamindari*. In most of the permanently settled areas and in the *jagirdari* areas, however, there is scarcely any revenue administration on behalf of the Government and the effective implementation of land reforms becomes a matter of some doubt. The responsibilities which a Government assumes with the abolition of *zamindari* are not confined to the collection of rent, for, important obligations relating to waste lands, forests, fisheries and other miscellaneous rights have to be accepted. We have referred to this aspect already in the chapter on the administration of district development programmes and suggest that the States concerned should give high priority to the solution of administrative problems which arise from the abolition of *zamindari* and, in particular, to the building up of sound revenue administrations.

8. A revenue administration depends, in the last resort, upon a good system of village records. In States like West Bengal, Bihar, Orissa, Rajasthan and Ajmer, there are scarcely any village records. In Hyderabad and certain other areas, over large tracts, there existed a system of village records maintained by *zamindars* and *jagirdars* through their own petty employees. These records were seldom of adequate quality and could not be fully relied upon. Records of rights and other land records become even more important at a time when rapid changes affecting land have become a normal feature of legislative activity. It would not in fact be too much to say that in some States because of defective revenue records the implementation of reforms already enacted will remain incomplete and may even raise new problems which will come in the way of good administration.

SUBSTANTIAL OWNERS OF LAND

9. The growth of population and repeated sub-division have led to a system of distribution in land in which large estates are an exception and the vast majority of holdings are relatively small in size. Legislation for the abolition of *zamindari* and for the protection of tenants has already reduced to some extent the degree of disparity which existed in the distribution of land.

10. Information concerning the distribution and size of holdings is available only to a meagre extent. As a result of an enquiry addressed to State Governments, a certain amount of information which was readily available has been obtained and is given in the annexure to this chapter. Even in States which have an adequate system of land records, the data have to be corrected for the changes which have taken place during recent years on account of the abolition of intermediary rights or the merger of new territories. The data are also defective in that they do not distinguish between cultivated and uncultivated land and, in respect of land under cultivation, between irrigated and unirrigated land. Secondly, they do not indicate the effects of the tenancy legislation of the past few years. Under this legislation large numbers of tenants have acquired either rights of occupancy or of protected tenants and, at the very least, have obtained greater security of tenure. In considering the distribution of land as it exists at present for purposes of policy, it is important to know how much land is under the direct management of owners as distinguished from that held on lease by tenants. Before making other proposals on the subject, the first recommendation which we have to make is that during 1953 all States in India should cooperate in undertaking a census of land holding and cultivation. The lines on which this census should be held and the details of the information which should be secured should be worked out by an expert group and the operations should be so planned that they do not place excessive burden on revenue administrations in the States. In this connection, it may be observed that areas in which village records and the revenue administration are not adequate will present special problems. Unless the preliminary step that we have recommended is taken, we believe that it will be difficult to give practical effect to a number of other steps which remain to be taken in the field of land reform.

11. If allowance is made for factors such as quality of land, area under tenants and the elimination of *zamindari* and *jagirdari* rights, the general picture is one of numerous small holdings, a large proportion of them being uneconomic, a small number of middle peasants and a sprinkling of substantial owners. For reasons mentioned above, it is not possible at this stage to indicate the approximate numbers in each group. It is safe to suggest, however, that substantial owners who are directly engaged in managing their land without the intervention of tenants constitute a very small number.

12. If it were the sole object of policy to reduce the holdings of the larger owners with a view to providing for the landless or for increasing the farms of those who now have uneconomic fragments, the facts at present available suggest that these aims are not likely to be achieved in any substantial measure. The question whether some limit should not be placed on the amount of land that an individual may hold has, therefore, to be answered in terms of

general principles rather than in relation to the possible use that could be made of land in excess of any limit that may be set. We have considered carefully the implications of the various courses of action which are possible. It appears to us that, in relation to land (as also in other sectors of the economy) individual property in excess of any form that may be proposed has to be justified in terms of public interest, and not merely on grounds of individual rights or claims. We are, therefore, in favour of the principle that there should be an upper limit to the amount of land that an individual may hold.

13. The idea of an upper limit for land has already been given effect to in two different ways, namely, (1) as a limit for future acquisition and (2) as a limit for resumption for personal cultivation. Uttar Pradesh has, for instance, prescribed 30 acres as the limit for future acquisition. Similarly, where land is held by tenants, a land-owner may be permitted to resume up to a prescribed limit for personal cultivation. In Bombay this limit is set at 50 acres, in the Punjab at 50 "standard" acres, in Hyderabad at five times an economic holding, and in Uttar Pradesh, where the tenancy problem and the course of legislation differ from those of *ryotwari* areas, the limit for resumption is a holding of 8 acres. Although a number of States have not yet imposed limits for future acquisition and for resumption for personal cultivation, we consider that the determination of these limits is an essential step in land reform. Certain areas may, however, present special problems. It may happen, for instance, that in some States there may be a great deal of land requiring reclamation. Reclamation programmes may necessitate long period leases of comparatively fair-sized blocks of land where schemes for State farming or cooperative colonisation may be highly uneconomical or prohibitive in cost. Whether the expression 'future acquisition' should also include within its meaning the 'right to inherit' needs to be considered from the point of view of legislation for the imposition of estate duties which is now before Parliament. On this subject, therefore, at present we do not make any recommendation.

14. The question how the limit for resumption for personal cultivation or for future acquisition should be determined needs to be considered. In theory, there are five possible criteria with reference to which the limit may be fixed. Thus, the limit may be a varying multiple of (i) land revenue, (ii) value of the gross produce of land, (iii) value of net produce (or income) of land, (iv) sale value of land, and (v) lease value of land. Each of these criteria may prove useful in particular circumstances, but their limitations should be appreciated. Apart from the fact that in several parts of the country no land revenue assessment exists, different districts have been assessed at different times and on the basis of varying assumptions as to prices, yields and crop maturities. Comparisons of land revenue rates are, therefore, more valid as between different classes of land within a district than as between different districts assessed at different times and in varying circumstances. Statements about the value of gross produce of land are generally made on rough calculations and are sometimes misleading. The only satisfactory way of calculating the value of gross produce would be to prepare fresh estimates on the basis of a standard series of prices for commodities which go into the produce estimates prepared for different areas during settlement operations. This would be a laborious procedure which could hardly be commended and, frequently, the relevant basic information would not be available. The value of net

produce for an acre of land is calculated after making allowance for expenses of cultivation which may have to be borne by an owner of land as distinct from the tenant. In view of the rapid changes in tenancy conditions which have been and are taking place, it is not possible to use this criterion. On account of tenancy reforms and other factors, the average sale value of different classes of land is also a less useful criterion now than it was in the past. Moreover, a decade of high prices has somewhat distorted the picture. Similar considerations apply to the test of lease value which is further vitiated by the fact that little accurate statistical information covering a sufficient number of instances is available and also because much of the land is leased on the basis of a share in the crop.

15. In the last analysis any particular method of determining a limit implies an average level of income or, in real terms, an average quantity of agricultural produce which it is proposed should become some kind of maximum for an individual agricultural family. It is sometimes suggested that the fair course would be to determine the maximum holding of land in terms of an average annual income. This would give an accurate measure of the change in the rural social structure which was sought to be brought about and would also ensure that widely different standards for reducing disparities in income were not adopted for the agricultural and non-agricultural sectors in the economic life of the country. There is force in these considerations. It has to be recognised however, that calculations of the amount of land of given quality in any area which may be expected on an average to yield a specified income are subject to so much guess-work that without much more statistical information than is at present available, there are real difficulties in applying the criterion of average income. In actual land reform operations, as the work of resettlement of displaced persons on evacuee agricultural lands shows, there must be considerable flexibility in approach and, considerations of theory apart, it becomes necessary to adopt those criteria which will serve best against the background of the tenures and revenue arrangements peculiar to a State. Within a State, of course, for its different regions, the same criteria have to be followed. As one method of determining a limit, which may often prove applicable in practical work and is here used by way of illustration, it may be useful to apply a rough and ready criterion such as, for instance, a multiple in terms of what may be regarded as a "family holding" in any given area. A family holding may be defined briefly as being equivalent, according to the local conditions and under the existing conditions of technique, either to a plough unit or to a work unit for a family of average size working with such assistance as is customary in agricultural operations. Another possible method of indicating a limit may be to propose an average level of money income which the permissible holding may be expected to yield. The limit which may be appropriate has to be determined by each State in the light of its own circumstances but, broadly speaking, following the recommendations of the Congress Agrarian Reforms Committee, about three times the family holding would appear to be a fair limit for an individual holding.

16. Whether the principle of imposing a limit on holdings should receive retrospective effect and be applied to existing holdings raises wider issues than the limits proposed for future acquisition and for resumption for personal cultivation. The central question involved is whether, in the event of a limit being imposed, lands in excess of the limit can be acquired

for consideration which falls short of fair compensation, that is, their market value at the time of acquisition. Merits of the proposal apart, we are advised that such a course would not be consistent with the provisions of the Constitution. We would suggest that the problem needs to be considered in terms somewhat different from those in which proposals are commonly made.

17. The problem of land held by substantial owners falls into two distinct parts, namely, (i) land now under the cultivation of tenants-at-will, and (ii) land under the direct management of owners. Keeping in view the limit for resumption of personal cultivation, we suggest that for areas in excess of this limit the general policy should be to enable the tenants to become owners. To achieve this object, the following measures have to be taken simultaneously. First, tenants have to be given security of tenure which could well extend to the conferment of occupancy rights. Secondly, it would be necessary to determine the principles on which (a) the price of land should be fixed and (b) payment should be made by the tenant. Depending again upon the local conditions, the most convenient course might be to fix the price of land as a multiple of its rental value, and payment might be made in instalments spread over a period. We suggest that there is advantage in the Government establishing direct contact with tenants upon whom these rights are conferred and collecting land revenue from them rather than through owners, the price of land being recovered along with the land revenue. Payment of compensation to owners of land can be made in bonds much in the manner already adopted or proposed for intermediary rights.

18. Where land is managed directly by substantial owners and there are no tenants in occupation, public interest requires the acceptance of two broad principles :

- (i) There should be an absolute limit to the amount of land which any individual may hold. This limit should be fixed by each State, having regard to its own agrarian history and its present problems. The census of land holding and cultivation, which it is proposed to hold during 1953, will give the data relevant to this decision.
- (ii) The cultivation and management of land held by an individual owner should conform to standards of efficiency to be determined by law.

It is suggested that each State should enact suitable land management legislation. Under this legislation standards of cultivation and management should be laid down. Specific obligations should be prescribed, for instance, in respect of sale of surplus produce to the Government, production and sale of improved seed, wages and conditions of living and employment for agricultural workers, investment in farm improvements, etc. The legislation should also provide for suitable machinery for enforcing the various obligations. The legislation could be applied, in the first instance, to these holdings which exceed a limit to be prescribed which may be equal to or larger than the limit for resumption for personal cultivation, and future acquisition, depending upon the conditions in a State.

19. As a practical approach to the problem of large individual holdings, it would be best to divide substantial farms which are directly managed by their owners into two groups, namely those which are so efficiently managed that their break-up would lead to a fall in production, and those which do not meet this test. For the latter category, the land management legislation should give to the appropriate authority the right to take over for the purpose of management the entire farm or such portion of it as might be in excess of the limit for resumption of personal cultivation and, secondly, the right to arrange for cultivation of lands so taken over. For the cultivation of such lands, preference could be given to cooperative groups and to workers on the lands which pass into the control of the land management authority. The proposals made above would provide for a large measure of redistribution of land belonging to substantial owners. In the legislation a date might be indicated with effect from which the law would be enforced in respect of farms in excess of the prescribed limit. Generally speaking, in order to set up the machinery for land management and to undertake the necessary survey before the law can be enforced effectively, a period of about two to three years might be necessary.

SMALL AND MIDDLE OWNERS

20. The expressions 'small' and 'middle' owners cannot be defined precisely but, for most purposes, it might be sufficient to consider owners of land not exceeding a family holding as small owners and those holding land in excess of one family holding but less than the limit for resumption of personal cultivation (which may be three times the family holding) as middle owners. In the case of small and middle owners, the social considerations which apply are of a different order from those relevant to the circumstances of the larger owners. The general aim of policy should be to encourage and assist these owners to develop their production and to persuade them to organise their activities, as far as a possible, on cooperative lines. Small owners include many who have uneconomic holdings which are also seriously fragmented. The experience of consolidation of holdings in Punjab, Madhya Pradesh and Bombay has established the value of this measure for small holders. We suggest that since the idea of consolidation of holdings is well understood by the peasants and they are prepared to meet a large part of the cost, in all States programmes for the consolidation of holdings should be expanded and pursued with vigour. The second important measure which has been taken in some States for the benefit of small holders relates to the fixation of a minimum holding below which subdivision is not permitted. There has been no investigation yet into the practical working of measures for the prevention of sub-division below a minimum such as have been taken in Bombay and Uttar Pradesh. It is, therefore, difficult to say to what extent they have proved immediately beneficial. They are, however, sound in conception and, while they need to be observed more closely in practice, we think that they could be extended.

21. The suggestion is sometimes made that in the event of redistribution of land belonging to substantial owners, those who have uneconomic holdings should receive additional land in order that their holdings may become economic. The effect of the proposals that we have made earlier in respect of lands of substantial owners will be to confer rights which will develop into ownership mainly on those tenants and workers who are already engaged in the cultivation of lands in excess of the limit for resumption for purposes of cultivation. In the ordinary

course, therefore, there may not be much land available for the purpose of enlarging the holdings of uneconomic owners. The problem of uneconomic holdings has certain wider aspects to which we shall refer later. The solution lies more in the direction of evolving a suitable system of co-operative management of the land of a village and the organisation of co-operative farming groups rather than in attempting too many little adjustments in the holdings of individual owners or cultivators of small plots.

22. Lands belonging to small and middle owners may be divided into two categories, namely, those under direct cultivation, and those leased to tenants-at-will. The problems which the former present are those of finance, technical assistance and organisation of co-operative activity. As regards the latter, two considerations are important. In the first place, any measures which are taken to protect the tenants of small and middle owners should be simple to administer and, as far as possible, the problems which they raise should be solved at the village level by the people themselves. Secondly, care should be taken to ensure that measures for the protection of small and middle owners do not operate seriously to reduce the movement of the people from rural areas into other occupations, whether in towns or in villages. The pressure on land is already heavy and is growing. Voluntary movement of villagers into other vocations has considerable advantage for the development of rural economic life, especially in conditions in which those who go out of the village for work retain their village roots and are encouraged to maintain an active sense of obligation towards the village community of which they continue to be members. There is little to be gained by treating the leasing of land by small and middle owners as examples of absenteeism to be dealt with along the same lines as lands belonging to substantial owners which are cultivated by tenants-at-will. At the same time, steps have to be taken to afford adequate protection to the tenants of small and middle owners.

TENANTS-AT-WILL

23. The central question to be considered in respect of tenants-at-will who are engaged in the cultivation of lands belonging to small and middle owners relates to the terms on which the latter may resume land for personal cultivation. A distinction may be made between those small and middle owners who cultivate themselves and those who do not. Land could only be resumed for cultivation by an owner himself or by the members of his family. We suggest that resumption should be permitted on this ground for the number of family holdings not exceeding three which can be cultivated by the adult workers belonging to an owner's family with the assistance of agricultural labour to the extent customary among those who cultivate their own lands. A period may be prescribed—five years for instance—during which an owner may resume for personal cultivation. If he fails to do so during this period, the tenant should have the right to buy the land he cultivates on terms similar to those suggested earlier for the tenants of the larger landholders.

24. The rights of tenants who cultivate the lands of small and middle owners need to be defined. The two principal questions to be considered relate to the period of tenancy and the rent which the tenant may have to pay. We suggest that the tenancy should ordinarily be for

five to ten years and should be renewable, resumption being permitted, as suggested earlier, if the owner himself wishes to cultivate. As regards the determination of rent, in recent years in various States, rents have been steadily reduced. In Bombay the rent of agricultural land was reduced to one-third of the produce (or its value) for unirrigated lands and to one-fourth of the produce for irrigated lands. In the Punjab, rent has been reduced from one-half to one-third of the produce for lands cultivated by owners whose holdings exceed the limit prescribed for resumption of personal cultivation. The determination of rent has to be regarded essentially as a question for consideration in the light of local conditions. The essential principle would appear to be that the rent of land should be so fixed that, having regard to his expenses of cultivation and other risks, a fair wage remains for the cultivator. While it is difficult to suggest a generally applicable maximum rate of rent, over the greater part of the country, a rate of rent exceeding one-fourth or one-fifth of the produce could well be regarded as requiring special justification.

LANDLESS WORKERS

25. Schemes of land distribution are likely to confer somewhat restricted benefits on agricultural workers other than tenants. This is because in any scheme of distribution or resettlement the first claim will be that of tenants already working on lands which may be taken over from the larger owners. In view of this difficulty, the contribution which the movement for making gifts of land, which has been initiated by Acharya Vinoba Bhave, has special value, for, it gives to the landless worker an opportunity not otherwise easily available to him.

26. It would be difficult to maintain a system in which, because of accidents of birth or circumstance, certain individuals are denied the opportunity of rising in the social scale by becoming cultivators and owners of land. It is, therefore, necessary to consider the problem in terms of institutional changes which would create conditions of equality for all sections of the rural population. The essence of these changes lies in working out a co-operative system of management in which the land and other resources of a village can be managed and developed so as to increase and diversify production and to provide employment to all those who are able and willing to work. The growth of industrialisation and of tertiary services is essential if any scheme of agricultural reorganisation is to succeed. Given this condition, whether the rural economy will expand and its techniques develop rapidly enough will depend largely upon the manner in which it is re-organised.

COOPERATIVE FARMING

27. Small and uneconomic holdings are at the root of many of the difficulties in the way of agricultural development. With the growing pressure on land, their number is increasing. Where agriculture does not require much investment, natural conditions are favourable and the cultivators are skillful and industrious, it is possible that the average yield on small farms may be higher than the average for many of the larger farms. The problem in India is to secure a large increase in production over the entire area now under cultivation. This calls for the

application on a wide scale of scientific knowledge and increased capital investment in various forms. These conditions are easier to secure where land is worked and managed in fairly large units than in the form of petty and fragmented holdings. In a farm of substantial size it is possible to eliminate several wasteful operations and to ensure better planning of the use of land, including selection of crops, rotation, soil conservation, development of irrigation and introduction of improved techniques. Economies which cannot be availed of by small farms are available to large ones. By its very nature a larger unit of operation and management can secure more credit and finance and can apply these to greater advantage, can diversify its economy and can make a relatively greater contribution to the solution of the country's food problem.

28. For these reasons it is important that small and middle farmers, in particular, should be encouraged and assisted to group themselves voluntarily into co-operative farming societies. These societies may be formed on conditions such as the following :—

- (i) The area under a co-operative farming society should not be less than a prescribed minimum. This could be fixed according to circumstances, as, say, four to six times the family holding in an area. It is perhaps not necessary to prescribe a maximum for a co-operative farming society ;
- (ii) Preference should be given to co-operative farming societies in the matter of supplies, finance, technical assistance and marketing ;
- (iii) In undertaking consolidation proceedings, preference might be given to villages in which co-operative farming societies are formed ;
- (iv) Preference should be given to co-operative farming societies in leasing agricultural waste lands belonging to the Government or taken over from private owners with a view to development. Suitable assistance in bringing such lands under cultivation should also be given ;
- (v) It could be provided that so long as a co-operative farming society continues, no adverse tenancy rights would accrue against those of its members who might not engage in personal cultivation. The object of this concession is not to affect in any way the rights of existing tenants (as they should enter the co-operative farming society as members) but to encourage individual small and middle owners to join together to form co-operatives.

A widespread extension of the practice of co-operation in non-farm as well as farm operations will be a major determining factor in achieving the rapid re-organisation of the village economy.

COOPERATIVE VILLAGE MANAGEMENT

29. While the extension of co-operative farming and co-operative activities generally will do much to develop the social and economic life of the village and, in particular, will benefit small and middle landholders, the scope of rural organisation has to be conceived in wider terms. We have referred already to the fact that without a basic reconstruction of the village economy

it is not possible to create conditions of equality of opportunity for the landless agricultural workers. Even after the problems relating to lands belonging to substantial owners have been dealt with, there remains considerable disparity of interest between the small and middle owner, the tenant and the landless worker. Concessions to one section at the expense of another may certainly benefit a few, but intrinsically the measures which may be taken may not promote sufficiently the rapid increase of agricultural production or the diversification of rural economic life or the growth of greater local employment. The possibility of achieving greater social justice through regulation of contractual terms between different constituent elements in the village is soon exhausted. Apart from sharpening the conflict of interests within the rural community, proposals for further regulation become in effect proposals for sharing poverty. While the objective of family holdings with increasing emphasis on co-operative methods of organisation may represent the most practical method of translating into practical action the principal of 'land for the tiller', the effective fulfilment of this very principle requires that there should be a more comprehensive goal towards which the rural economy should be developed.

30. For several reasons it has become imperative that at the village level there should be an organisation deriving its authority from the village community and charged with the main responsibility for undertaking programmes of village development. In an earlier chapter we have suggested how these functions may be taken over by the village panchayat and how the panchayat may be strengthened for the purpose. In relation to land policy the role of the village panchayat becomes an extremely important one, because there are certain problems which none but the panchayat can deal with. These may be briefly mentioned :

- (1) Tenancy legislation frequently proves infructuous because of the lack of administrative arrangements for enforcing it. It is known, for instance, that entries in revenue records relating to personal cultivation are not always correct where the owners in question have a fear of losing their lands to tenants in the event of future tenancy legislation.
- (2) While it is necessary to safeguard the interests of small and middle owners and permit them to resume land for personal cultivation, some way must be found for ensuring that the tenant who is thereby displaced has land to cultivate. It would make for cumbrous arrangements if a small owner's right to resume land for personal cultivation were made subject on each occasion to the proviso that a certain amount of land must be left for cultivation with the person who happens to be his tenant. Proposals of this character have a limited value but the fact has to be reckoned with that they are very difficult to work and may cause much continuing friction and frustration in the daily life of the village community.
- (3) It is necessary that tenants, even when they are displaced by small owners, should be able to obtain at least a minimum holding for cultivation. What the minimum should be can be determined with reference to local conditions, but the limit below which, under the law, sub-division of holdings is not permitted, may be found to be a useful indication. If, for sheer lack of land, it is not possible to provide a minimum holding, then the obligation to provide work in some other form ensues.

- (4) When lands belonging to substantial owners who do not meet the standards of efficiency prescribed by the land management legislation have to be settled with new tenants, the selection has to be made by some organisation at the village level.
- (5) The cultivation of village waste lands is the responsibility of the village panchayat and for this purpose arrangements for cultivating these lands have to be made.

31. For the performance of the functions described above, the only answer appears to be that the village panchayat should become the agency for land management and land reform in the village. In other words in the case of all owners any leasing of land should be done, not directly, but through the village panchayat. Experience of the practical working of restrictions on subletting suggests that these restrictions do not work out well in practice and the need for permitting some subletting is not adequately met through the listing of a few exceptions in favour, for instance, of those who are, for any valid reasons, unable to look after their lands. In addition to being the agency through which leases of private lands belonging to small and middle owners take place, the village panchayat has also to be the body principally concerned with the management of lands belonging to substantial owners which are made available for cultivation and for village waste lands. If the village panchayat has all these functions, then it may be possible for it to provide holdings of minimum size for landless cultivators. Its capacity to do so may frequently be limited by the amount of land available in relation to the number of workers who have to be provided. This very factor suggests the need for planning development over groups of villages such as are comprised in community projects, and for vesting in the village panchayat functions which go beyond the management of those lands in the village which are not cultivated by their owners. In other words, the conception of co-operative management has to be extended to include the entire land of the village as well as activities for creating non-agricultural employment and providing social services.

32. The system of co-operative reorganisation which will be found most feasible in practice has to be evolved by village communities out of the practice of co-operation in various directions and according to their own needs and problems. From the side of the Government what is needed is that village communities should receive sufficient guidance and assistance and, secondly, that the law should give them the means for bringing about the necessary changes in the management of land. There are at present in progress throughout the country a number of experiments in co-operative farming and in the organisation of various activities on co-operative lines. If systematic study of this experience were made, useful suggestions which could assist the progress of co-operative effort throughout the country would emerge. There is need also for an expanding programme of training and experiments in cooperative farming and co-operative organisation. For this purpose, in the Five Year Plan Rs. 50 lakhs have been provided by the Central Government.

33. The second aspect has to be dealt with mainly through the land management legislation. It is suggested that such legislation might include a provision conferring upon the village panchayat rights of management of village lands which are either lying uncultivated or are not directly cultivated by their owners. Secondly, it could be provided that if, for instance, a

majority of the owners and occupancy tenants in a village wished to enter upon co-operative management of the land of the village, their decision should be binding on the village as a whole. To ensure confidence among all concerned, it could also be prescribed that those who express themselves in favour of co-operative management should as a body hold permanent rights in at least one-half of the land of the village, no individual holding being reckoned for this purpose in excess of the limit prescribed for resumption of personal cultivation.

34. The primary object of co-operative village management is to ensure that the land and other resources of a village can be organised and developed from the stand-point of the village community as a whole. The rights of ownership are determined by the land reforms legislation of a State. Even after a system of co-operative management is established, the rate of rent or ownership dividend to be allowed to an owner in respect of his land will be determined on the basis of the tenancy laws of a State. What the land management legislation enables a village community to do is to manage the entire area of a village, both cultivated and uncultivated, as if it were a single farm. According to circumstances, the actual cultivation could be arranged, as might be found feasible, in family holdings, through small groups working blocks of land in the village on co-operative lines or through a combination of arrangements adapted to the operations to be carried out. As techniques develop and the manpower requirements of occupations other than farming increase, still larger blocks of land could be worked co-operatively. According to their needs and experience, village communities will discover the arrangements which serve them best. There has to be a great deal of trial and experiment before patterns of organisation which will best promote the interests of the rural population can be evolved. Nevertheless, it is important to work towards a concept of co-operative village management, so that the village may become a vital, progressive and largely self-governing base of the structure of national planning and the existing social and economic disparities resulting from property, caste and status may be obliterated.

CENTRAL ORGANISATION FOR LAND REFORMS

35. In the years following the achievement of freedom, it was natural that State Governments should endeavour to translate their programmes of land reform into action with the utmost speed. Some States carried out exhaustive enquiries before undertaking legislation. These enquiries were quite adequate for the first steps in land reform which related to the abolition of intermediary rights. Detailed information concerning the holding and cultivation of land, to which reference has been made earlier can be collected from village records. As a rule, however, such information is not available in the form and detail now required for a State as a whole or for individual districts. The stage has now been reached when new measures of land reform should be based on objective assessment of the working of measures already introduced. Since land reform affects every aspect of rural life, the evaluation of land reform programmes requires trained investigators. Within each State, therefore, there is need for some machinery for investigating and reporting upon the progress of measures of land reform. In the Central Government also there is need for an organisation which could pool knowledge

and experience gained in the States and could suggest lines for further investigation. When millions of persons are affected by measures proposed by the Central Government or by the States or by political parties, it becomes a matter of the greatest importance that proposals should be tested with reference to data which have been correctly ascertained and embody experience which has been carefully evaluated. Equally, it is important to maintain a continuous record of information concerning progress in the implementation of land reform programmes adopted by the States. To assist in the process, we recommend the establishment in the Central Government of a land reforms organisation. The details of the organisation which will be needed in connection with the implementation of a national programme of such vital importance as land reform and co-operative reorganization of the rural economy will need to be worked out carefully. We believe that such an organisation will prove to be of considerable value both to the Central Government and the States and will help the progress of land reforms.

ANNEXURE

SIZE OF HOLDINGS

(Proprietary and occupancy holdings)

(Figures in thousands)

Size group	Number of holdings	Percentage of holdings	Area (acres)	Percentage of area	Remarks
I	2	3	4	5	6
1. <i>Uttar Pradesh</i>					
0—5 .	9,971	81.2	16,024	38.8	The entire occupied area prior to merger which was 90% of the present occupied area, was included in the inquiry.
5—10 .	1,563	12.7	10,824	26.	
10—16 .	440	3.6	5,464	13.2	
16—25 .	190	1.6	3,694	9.0	
Over 25 acres .	114	0.9	5,310	12.9	
TOTAL .	12,278	100.0	41,316	100.0	
2. <i>Bombay</i>					
0—5 .	1,313	52.31	3,672	14.00	Figures relate to the entire <i>ryotwari</i> area prior to merger.
5—15 .	707	28.18	6,548	24.95	
15—25 .	274	10.90	5,163	19.68	
25—100 .	201	8.02	8,114	30.92	
100—500 .	14	0.57	2,314	8.82	
500 over .	1*	0.02	428	1.63	*The actual number is 563.
TOTAL .	2,510	100.00	26,239	100.00	
3. <i>Madhya Pradesh</i>					
0—5 .	1,296	51.5	2,856	10.0	Figures relate to 77 per cent of the total occupied area of the State. The remaining 23 per cent area not covered by the inquiry forms part of the merged territories
5—10 .	493	19.5	3,528	12.0	
10—20 .	375	14.8	5,656	18.6	
20—50 .	269	10.7	8,453	28.9	
50—100 .	63	2.5	4,110	14.0	
100—500 .	26	0.9	3,680	12.9	
500 over .	0.93	0.04	1,067	3.6	
TOTAL .	2,522.93	100.0	29,350	100.0	

ANNEXURE
SIZE OF

I	2	3	4	5	6
4. Orissa					
0—5 .	N.A.	74.2	N.A.	30.1	The data are based on a sample survey conducted in different parts of the State covering an area of 60,230 acres.
5—10 .	N.A.	15.3	N.A.	22.0	
10—20 .	N.A.	7.1	N.A.	20.8	
20—50 .	N.A.	3.0	N.A.	17.1	
50—100 .	N.A.	0.3	N.A.	4.1	
Over 100 acres	N.A.	0.1	N.A.	5.9	
TOTAL .		100.0		100.0	
5. Bihar					
0—5 .	N.A.	83.3	N.A.	N.A.	The data are based on a sample survey which was not considered adequate. The figures are, therefore, to be taken as indicative of the general situation.
5—10 .	N.A.	3.4	N.A.	N.A.	
10—15 .	N.A.	7.8	N.A.	N.A.	
15—30 .	N.A.	2.5	N.A.	N.A.	
30—50 .	N.A.	2.0	N.A.	N.A.	
50 acres and above	N.A.	1.0	N.A.	N.A.	
TOTAL .		100.0			
6. Assam					
0—5 .	N.A.	66.1	N.A.	26.0	The sample survey relates to 26,000 acres comprised in 5,295 holdings.
5—10 .	N.A.	22.5	N.A.	32.9	
Over 10 acres	N.A.	11.4	N.A.	41.1	
TOTAL .		100.0		100.0	
7. Madras					
Holdings assessed on :					
1. Rs. 10 and less	5,906	82.2	11,356	41.2	The data relate to the <i>ryot-wari</i> area which represents <i>pattas</i> 82 per cent of the total area and represents estimates. The holdings include joint <i>pattas</i> . The area comprised in individual holdings in the larger size groups may, therefore, be considerably smaller.
2. Over Rs. 10 but not exceeding Rs. 30.	822	11.4	7,504	27.2	
3. Over Rs. 30 but not exceeding Rs. 50.	264	3.7	2,826	10.2	
4. Over Rs. 50 but not exceeding Rs. 100 (23—45 acres).	137	1.9	2,337	8.5	
5. Over Rs. 100 but not exceeding Rs. 250 (45—114 acres).	46	0.6	1,692	6.0	
6. Over Rs. 250 (over 114 acres)	14	0.2	1,876	6.9	
TOTAL .	7,189	100.0	27,591	100.0	

—contd.

HOLDINGS—contd.

1		2	3	4	5	6
8. Mysore						
0—5	.	820	66.2	2,061	25.3	The entire area of the State was included in the inquiry.
5—10	.	265	21.2	2,002	24.0	
10—50	.	144	11.4	2,898	35.0	
50—100	.	11	0.9	856	10.3	
100—500	.	2	0.2	379	4.6	
Over 500	.	0.1	0.1	67	0.8	
TOTAL	.	1,242	100.0	8,263	100.0	
9. Travancore-Cochin						
0—5	.	1,541	94.1	1,322	44	
5—10	.	56	3.4	368	13	
10—15	.	21	1.3	253	9	
15—25	.	11	0.7	207	7	
25—50	.	4	0.3	158	5	
50—100	.	2	0.1	118	4	
Over 100	.	1	0.1	493	18	
TOTAL	.	1,636	100.0	2,914	100	
10. Pepsu						
0—5	.	239	45.4	518	8.2	The entire area of the State was included in the inquiry.
5—10	.	93	17.6	680	10.7	
10—20	.	107	20.3	1,572	24.8	
20—50	.	771	13.4	2,072	32.6	
50—100	.	—	—	543	8.6	
100—500	.	17	3.3	227	3.5	
Over 500	.					
TOTAL	.	527	100.0	6,347	100.0	
11. Delhi						
0—10	.		N.A.			
10—20	.	30	N.A.	10	N.A.	
20—50	.	1	N.A.	45	N.A.	
50—100	.	0.2	N.A.	17	N.A.	
Over 100	.	0.1	N.A.	13	N.A.	
TOTAL	.	31.3	—	85	—	

THE FIRST FIVE YEAR PLAN

ANNEXURE—*concl'd.*SIZE OF HOLDINGS—*concl'd.*

1		2	3	4	5	6
12. <i>Himachal Pradesh</i>						
0—5	.	69	95.0	83	71	The data relate to Chamba district only.
5—10	.	2	3.0	13	11	
10—15	.	1	2.0	12	10	
Over 15	.	1	0.1	1	8	
TOTAL	.	73	100.0	119	100	
13. <i>Coorg</i>						
0—5	.	42	76.0	128	30.0	The entire area of the State is included.
5—10	.	7	12.0	54	13.0	
10—15	.	3	5.0	31	7.0	
15—25	.	2	3.0	34	8.0	
25—50	.	1	2.0	31	7.0	
50—100	.	0.5	1.0	35	8.0	
100—500	.	0.4	1.0	95	23.0	
Over 500	.	0.02	..	15	4.0	
TOTAL	.	55.9	100.0	423	100.0	
14. <i>West Bengal</i>						

Percentage of cultivators according to size of holding.

	According to Floud Commission's report (%)	According to the 1951 census (%)
0—2 acres .	41.9	34.4
2—4 acres .	20.6	27.6
Over 4 acres	37.5	38.0

CHAPTER XIII

THE AGRICULTURAL WORKER

MAGNITUDE OF THE PROBLEM

THE EXPRESSION 'agricultural workers' denotes those rural workers who are employed on wages in agricultural occupations. In the census of 1951, out of a total rural population of 295 million, 249 million are shown as being engaged in agriculture. Of these, 18 per cent were returned as cultivating labourers and their dependents. The census classified the agricultural population into four classes, namely, (1) cultivators of land, wholly or mainly owned; (2) cultivators of land wholly or mainly unowned; (3) cultivating labourers; and (4) non-cultivating owners of land. Cultivating labourers were broadly defined as employees of cultivators. Since, for varying periods, small owners, tenants and artisans find themselves working as cultivating labourers, the line between agricultural workers and the other agricultural groups is subject to marginal shifts and agricultural workers may be broadly described as a residuary group in the rural community.

2. In the past, not enough attention has been given to the problems of agricultural workers and information concerning the conditions under which they live and work has been extremely meagre. Since 1949 the Central Government have been engaged in carrying out a comprehensive enquiry for the collection of data on employment, earnings, standard of living and indebtedness of agricultural workers. The object of this enquiry was to enable the Central and State Governments to initiate protective and ameliorative measures, including the fixation of minimum wages. For the purpose of this enquiry, an agricultural labour family was defined as one in which either the head of the family or 50 per cent or more of the earners reported agricultural labour as their main occupation. The field operations under the Agricultural Labour Enquiry, which embraced 813 villages selected on the basis of random sampling and 104,000 families all over the country, have now been concluded and the data are under study. The enquiry has helped already to draw attention to the significance of the agricultural worker in the country's future development and its results are likely to be of material assistance in drawing up programmes for agricultural workers.

3. Until the data obtained in the agricultural labour enquiry become available, any assessment of the magnitude of the problem of agricultural workers for the country as a whole has to be based on the returns of the census of 1951. The census shows wide variations in different parts of the country in the proportion of the agricultural population who constitute agricultural workers. Among the States in which agricultural workers constitute substantial sections of the agricultural population are Travancore-Cochin (37%), Bhopal (31%), Madras

(28%), Madhya Pradesh (27%), Bihar and Hyderabad (25%) and West Bengal (21%). Bombay, Orissa, Punjab, Madhya Bharat and Pepsu have an agricultural labour population varying between 12 to 15 per cent. Among the larger States, Uttar Pradesh has the lowest percentage (8%).

4. Agricultural workers may be classified broadly into two groups, namely, 'casual' workers and 'attached' workers. Casual workers are by far the larger group, representing in the recent enquiry undertaken by the Government of India, as many as 89 per cent of the total number. In this enquiry, 'attached' workers were defined as those who had continuous employment for one month or more at a time. The proportion of 'attached' workers is higher in some States, being about 24 per cent in the Punjab, 22 per cent in Bihar and 20 per cent in U.P. as compared, for instance, to about 6 per cent in West Bengal. Recent enquiries suggest that the period of unemployment for agricultural workers ranges from three to six months, interspersed in different seasons during the year. Plantation workers, who number about 1.2 million, constitute a distinct class of agricultural workers who are perhaps closer to industry than to agriculture.

5. Another class of agricultural labourers consists of those who leave their villages in groups for fairly long terms in search of employment. A large number of them can be seen in the more important cities without practically any shelter. As the influx of such workers is likely to continue, a first step should be to provide clean camp sites equipped with water supplies and sanitary arrangements. This would also reduce the risk of epidemics in the cities. A sample survey of such persons might give valuable information about their condition.

APPROACH TO THE PROBLEM

6. The existence of large numbers of agricultural workers who lack sustained employment and frequently suffer from social handicaps is to be regarded as a source of serious weakness and even of instability in the present agrarian system. With the decline in rural industry, many artisans have become part-time labourers. The increase in fragmentation and subdivision of holdings has driven many peasant farmers to seek casual labour. Reduction in the larger farms which has been in progress in consequence of tenancy legislation leads to a diminution in the amount of higher employment which may be available. Few agricultural workers are dependent on agricultural labour alone; commonly they also combine other casual work with agricultural labour. Generally, agricultural workers have short periods of intensive employment, for instance, at harvest time or in sowing season or when cotton is picked. As compared to the farmer, the agricultural workers' problem, is perhaps in a larger measure one of unemployment rather than of under-employment, but the degree of unemployment depends almost entirely on the character of local agriculture and on the distance from urban centres.

7. The Five Year Plan has to be viewed as a comprehensive programme to remove the social and economic causes which account for the present condition of the agricultural workers. As a section of the village community, the economic condition of the agricultural workers depends upon the state of prosperity in the agricultural economy. The programmes under the Five Year Plan aim at increasing agricultural production substantially. Extension of irrigation, intensive cultivation and improvement in agricultural practices will increase rural employment and thus afford greater opportunity to agricultural workers. Through measures related to land reform many tenants, who are also in some part agricultural labourers, will obtain security and greater protection and will be on the way to becoming owners. Some land, especially that which is not now under the cultivation of tenants, will also be available for agricultural workers. It will be recalled that in making proposals for the reorganisation of the rural economy on co-operative lines, one of the major objects in view is to carry out changes which will rapidly place the agricultural worker in a position of equality in status and opportunity with other sections of the village community. As the economy as a whole develops, an increasing number of workers will be drawn away from the village, so that both those who move out of the village and those who remain in the village are likely to obtain more adequate employment. In addition to the industrial programmes in the Plan and those relating to transport and other fields of economic life, the Plan contains important programmes for village industries and the promotion of *khadi*. These will be of direct benefit to agricultural workers.

8. Agricultural labour populations are concentrated most in areas where population presses heavily on the land and the development in sectors of the economy other than the agricultural has been retarded. By selecting such areas for special programmes such as community development projects, it should be possible to make a distinct contribution to the problem of rehabilitating agricultural workers, for increase in the tempo of development is the effective answer to the problem of unemployment and under-employment.

9. While a number of different programmes in the Five Year Plan will promote the interests of agricultural workers, special mention may be made of two which bear directly on their welfare. In the plans of State Governments about Rs. 23 crores are provided for the amelioration of backward classes. About two-thirds of this amount should be available for backward classes other than scheduled tribes, of whom a large proportion are to be counted among the agricultural workers. The Central Government's plan has also provided a sum of Rs. 4 crores for the welfare of scheduled castes and other backward classes, in addition to programmes for scheduled tribes and scheduled areas. Furthermore, in the Central Government's plan a sum of Rs. 2 crores has been set aside for resettlement schemes for landless agricultural workers.

MINIMUM WAGES

10. Under the Minimum Wages Act, State Governments are required to fix minimum rates of wages for agricultural labour by the end of 1953. The legislation permits them to fix minimum wages for such portions of the territories or for such classes of employment

as they might consider feasible. In most States steps to implement the legislation have already been initiated. In nine States, including Punjab and Uttar Pradesh, minimum wages have been fixed. In Uttar Pradesh minimum wages have already been fixed for farms over 50 acres in twelve districts. In a number of States draft proposals are at present under final scrutiny. Enquiries to ascertain low wage pockets are in progress as in Madras. The enforcement of minimum wages for agricultural workers in low wage pockets, for the larger farms and in areas selected for intensive development should be regarded as an important aspect of the programme for improving the conditions of agricultural workers and should receive high priority. We suggest that progress in the implementation of the minimum wage legislation should be reviewed from time to time at inter-State Conferences, so that experience gained in meeting common problems may be pooled and the implementation of the legislation expedited.

HOUSE SITES

11. Agricultural workers, not being owners of land in a village, are seldom the owners of the sites on which their houses are constructed. This makes them dependent on the consent either of individual owners of land or of village proprietary bodies. Landless workers holding temporary rights over house-sites in a village should be granted rights of occupancy in them. Where the house-sites are the common property of a village, the village panchayat should be placed under obligation to grant the sites free of charge to agricultural workers who may be in occupation of them. Even where the sites belong to individuals, by persuasion if possible and by legislation if necessary, the sites should be transferred in occupancy right to the landless workers who may be in possession of them. Such provision for compensation as may be unavoidable should be made and the obligation imposed upon village panchayats to provide the sites free of charge to the landless workers either by obtaining these by way of gift from the owners in question or by settling directly with the owners. In some areas the existing village site is so congested that a new village site has to be provided for further extension. The landless, and particularly the Harijans, should be fully represented in the allotment of sites in such extensions and, wherever possible, an effort should be made to provide small allotments for kitchen gardens. In the State programmes for amelioration of backward classes, the provision of house sites and of small backyards should receive special emphasis.

12. Full support should be given to the movement initiated by Acharya Vinoba Bhave for securing land gifts for the landless by providing means of cultivation and other assistance to landless labourers selected for the allotment of the gifted land. The movement has considerable moral value and, if pressed forward, holds promise of relief in meeting some of the urgent problems of landless workers. The State Governments could make it a permanent feature of the work of rural development which might continue beyond the pioneering phase.

LABOUR CO-OPERATIVES

13. With the assistance of the co-operative staff, the irrigation, buildings and roads, forest and agricultural departments and other government agencies in the States should try and organise co-operatives of village labourers. Under the technical guidance of their officials, these co-operatives should be encouraged and enabled to take up contracts for specific pieces of construction work. The success of forest labourers' societies in Bombay and of certain other similar efforts elsewhere suggests that, given suitable encouragement and assistance, the formation of labour co-operatives can make an important contribution to the relief of rural unemployment and, in addition, make it possible for the government to assist more adequately with social welfare schemes and other ameliorative measures.

RESETTLEMENT SCHEMES FOR LANDLESS WORKERS

14. Blocks of newly reclaimed land as well as culturable waste land should be set apart, wherever possible, for the settlement on co-operative lines of groups of landless agricultural workers and of holders of small, uneconomic plots of land. Even though the amount of land which could be thus made available would be limited and the proportion of agricultural workers who could be benefited might be small, the existence of such a scheme in each State could become a source of hope and encouragement in the lives of many families of agricultural workers and would go far to arouse confidence and enterprise in them. Within the scope of the programmes included in the Plan, there is considerable opportunity for organising co-operative settlements and colonisation schemes for agricultural workers and, as a matter of policy, the fullest use should be made of these possibilities. As already mentioned, the Plan makes a special financial provision to promote resettlement schemes for agricultural workers.

15. Being without land, agricultural workers have no security to offer. As a rule, therefore, they do not become eligible for financial assistance from the Government. While individual loans may present certain administrative difficulties, we suggest that State Governments should formulate schemes for granting financial assistance to co-operative groups of landless workers for such purposes as house building, purchase of bullocks and implements and for ancillary industries which they may wish to take up after suitable training under the auspices of Government. Special assistance by way of educational stipends and for vocational and technical training should also be offered, as indeed is already being done in many States.

16. In the past, there has been no agency on behalf of the Government for dealing with the social and economic problems of agricultural workers. The extension organisation in the districts, whose early establishment we propose elsewhere in this report, should concern itself with the problems of welfare and employment of agricultural workers no less than with those of agriculturists and every effort should be made to bring home to village panchayats their responsibility for the welfare of the agricultural worker equally with that of other sections in the community.

CHAPTER XIV

PROGRAMME FOR AGRICULTURE

IN AN earlier chapter we have indicated the shortages which exist in respect of foodgrains and the principal commercial crops. The problem of agricultural shortages has been intensified by certain special circumstances which arose during recent years, namely, the loss on account of Partition of about 20 million acres of irrigated land and the imperative need since 1949 of reducing the dependence of the jute and cotton industries on imported raw-materials. The programmes outlined in this chapter seek to overcome or reduce these deficiencies, to the extent possible, in respect of the major crops, namely, foodgrains, cotton, jute, oil seeds and sugarcane.

PRODUCTION TARGETS

2. The production targets in the Five Year Plan have been reached on the basis of programmes of works which aim at making specific additions to the existing production potential in each State. These programmes include, for instance, measures to bring additional areas under irrigation, to reclaim and develop new lands or bring fallow lands back to cultivation, and to extend the use of manures, fertilisers and of improved seeds. In assessing the agricultural targets which are proposed, three considerations need to be kept in view. In the first place, allowance for seasonal variations cannot be made in advance; these variations are inherent in agricultural production itself and may extend to as much as 10 percent of the average production thus upsetting all calculations. Secondly, through crop-cutting experiments and other tests, fairly reliable yardsticks about the production effects of different measures are now available for a number of States. In addition, as far as possible, in suggesting the targets every State has tried to take into account its own experience over the past few years. In the third place, estimates of increased production resulting from the programmes have been made on a cautious basis, especially in respect of schemes for the increased use of improved seed and manures and fertilisers. It is true that through improved agricultural practices and double cropping it is possible to secure a substantial increase in production in the course of a few years. On the other hand, until there is sufficient assurance that these practices have become part of the normal operations of agriculture in any area, there is some risk of over-estimation of the possible benefits which may be anticipated.

3. The targets of additional production envisaged in the Plan are as follows:—

Commodity	Quantity (in millions)	Percentage increase
Foodgrains	7.6 (tons)*	14
Cotton	1.26 (bales)	42
Jute	2.09 (bales)	63
Sugarcane	0.7 (gur tons)	12
Oilseeds	0.4 (tons)	8

*The target of 7.6 million tons of foodgrains would roughly comprise about 4 million tons of rice, two million tons of wheat, a million tons of gram and pulses and 0.5 million tons of other cereals.

These targets have been arrived at as a result of prolonged discussions with State Governments. They were first worked out in the summer of 1951 and early in 1952 the programmes on which they were based were reappraised in considerable detail in a series of conferences with representatives of individual State Governments. As a result of the re-appraisal the targets for cotton, jute, sugarcane and oilseeds were those indicated above. In regard to foodgrains, however, as against the initial target of 7·2 million tons, re-appraisal indicated a total increased production over the five year period of only 6·5 million tons. If allowance were to be made for diversion of area from foodgrains to commercial crops, the net increase in the production of foodgrains worked out to about 6·0 million tons. The diversion in the area from food to commercial crops or *vice versa* does not, however, follow a fixed pattern from year to year and is governed by various considerations such as seasonal factors, rotation of crops, changes in prices and the ability of the growers to finance the operations*.

4. The shortfall in the original targets was recently examined by the Grow More Food Enquiry Committee. The Committee recommended additional measures so that, at the very least, the target for foodgrains proposed in 1951 for the five year period could be realised. The agricultural programme, as now presented, consists of two parts, namely, (a) schemes of State Governments, which together account for a total net food production target of 6·0 million tons to be achieved at a total cost of Rs. 125 crores; and (b) supplementary schemes proposed by the Planning Commission with a view to achieving additional food production of at least 1·6 million tons. The detailed break-up of the agricultural targets given in this chapter relates to the schemes of State Governments. During the course of implementation of the Plan, the additional schemes will be further considered in consultation with State Governments, and incorporated into the programmes of individual States. The measures now proposed as supplementary to those already included in the State programmes are as follows:—

	(Rs. crores)
(1) Additional provision for minor irrigation works	30
(2) Additional programme for the construction of tubewells	6
(3) National extension organisation for intensive area development	3
(4) Supplementary allotment for Grow More Food during 1952-53	10
(5) Community projects, including 55 projects already initiated	90

Two other measures may be mentioned. In the later stages of the Plan it is expected that the fertiliser programme will be substantially enlarged. The Plan also provides for agricultural finance on a very much larger scale than has been hitherto considered possible. It is now expected that in accordance with the recommendations of the Grow More Food Enquiry Committee, by 1955-56 short-term finance to the extent of Rs. 100 crores will become available to the farmers from the Government and through the co-operative movement. During the period of the Plan about Rs. 25 crores are likely to become available by way of medium-term finance and at least Rs. 5 crores by way of long-term finance. These proposals for agricultural finance, which are described more fully in a later chapter, include the amount of finance at present made available through government agencies and the co-operative movement.

*A considerable diversion to commercial crops took place during 1952.

THE FIRST FIVE YEAR PLAN

5. The precise effects on production of the expanded programmes referred to above are at present difficult to estimate in detail. They will depend upon the actual programmes which are adopted in consultation with the States. On the basis of past experience it is considered that an increase of 1·6 million tons in the production of foodgrain over and above the net estimate of 6·0 million tons on account of the present State programmes would be a cautious anticipation. Additional minor irrigation works are expected to provide an increase in food production of 0·6 million tons, community projects and intensive development area projects of 0·5 million tons, and the additional fertiliser programme of a further 0·5 million tons. Although these details have necessarily a tentative character, the general conclusion indicated above follows from the substantial increase in agricultural investment that is now contemplated and the steps which are being taken to create the necessary extension organisation. Depending upon the distribution of the additional investment as between different States, some increase in the production of commercial crops is also to be expected; for the present, however, the targets already worked out are being retained.

6. Whereas after the achievement of the targets outlined above the deficiency in foodgrains will have been largely met, gaps will still remain in respect of the commercial crops, though they will be considerably reduced. The Plan, therefore, provides for imports upto 1·2 million bales of cotton and 0·8 million bales of jute.

THE PROGRAMME

7. The increase of 6·5 million tons in food production through programmes worked out by State Governments as distinguished from the supplementary programmes mentioned in paragraph 4, is expected to be achieved as follows:—

	(mi lion tons)
Major irrigation works	2·01
Minor irrigation works	1·78
Land reclamation and development	1·51
Manures and fertilizers	0·65
Improved seeds	0·56
TOTAL	6·51

The break-up of 6·5 million tons by States is given in Appendix I to this chapter. The total area expected to receive irrigation from major and minor irrigation works during the period of the Plan is outlined in Appendix III. Including 3 million acres to be irrigated as a result

of the additional minor works programme costing Rs. 30 crores, to which reference has been made above, the total area which will come under irrigation during the period of the Plan is 19.7 million acres. Of this, minor irrigation works account for 11.2 million acres as below:—

	(million acres)
(a) Schemes of State Governments	
1. Dams and channels	4.4
2. Wells (new and repaired)	1.4
3. Tube-wells (other than those included under major irrigation)	0.7
4. Tanks (improvement and construction)	0.8
5. Pumping installations	0.7
	TOTAL (a) 8.2
(b) Additional minor irrigation programme (Rs. 30 crores)	3.0
	TOTAL (a) and (b) 11.2

The details of the minor irrigation programme included in the State Plans will be found in Appendix IV. The total cost of the minor irrigation schemes including the special provision of Rs. 30 crores comes to about Rs. 77 crores. In addition, about a third of the expenditure on development in a community project is devoted to irrigation so that, with the progress of community projects, a larger area than that indicated above is likely to receive irrigation from minor works. In the execution of the minor irrigation programme three considerations have to be kept in view. Firstly, the schemes should be selected after a proper survey of the potentialities. Secondly, in selecting schemes a priority should be accorded to existing works which have gone out of use for lack of repairs and can be repaired at reasonable cost. Lastly, the benefits of minor irrigation schemes have been seen not to last for long for want of adequate arrangements for their repair and it is, therefore, necessary that the responsibility for the maintenance of the works be placed on local communities and, if necessary, a cess levied for the purpose.

8. The programme for land reclamation and development on which a total sum of Rs. 25 crores is provided in State Plans and Rs. 10 crores in the Central Plan on account of the Central Tractor Organisation envisages the reclamation of about 7.4 million acres of land. Of this, the Central Tractor Organisation is expected to reclaim 1.4 million acres and State Tractor Organisations 1.2 million acres. Reclamation by farmers with the assistance of State Governments and measures to bring recent fallows back into cultivation are expected to result in the development of a total area of 4.8 million acres. The bulk of this area lies in Hyderabad and Madhya Pradesh. It is important that in their agricultural programmes these two States should make adequate administrative arrangements to ensure that the proposed reclamation programme will be fulfilled. The Central Tractor Organisation expects to reclaim during the five-year period, 474,000 acres in Madhya Pradesh, 238,000 acres in U.P., 300,000 acres in Madhya Bharat, 400,000 acres in Bhopal and 4,000 acres in Vindhya Pradesh. Several States have been building up their own tractor organisations.

Details of area to be reclaimed in different States under the Plan are given in Appendix V. The Plan also provides for land improvement operations such as bunding and drainage to the extent of about 3 million acres and extension of mechanised cultivation to the extent of 3·4 million acres. Details of these programmes are also given in Appendix V.

9. Although the use of fertilisers has developed fairly rapidly during the past few years, there is considerable scope for further expansion and estimates of fertiliser requirements proposed in relation to the Five-Year Plan may be considered moderate. Agricultural programmes of the States assume an annual supply of 446,000 tons of nitrogenous fertilisers, 79,000 tons of superphosphates and 20,000 tons of bonemeal. It is expected, however, that during the course of the Plan the quantities which would in fact be available, after allowing for plantations and industries and assuming imports at an annual figure of about 150,000 tons, will be 610,000 tons of nitrogenous fertilisers and 176,000 tons of superphosphates in addition to 50,000 tons of bonemeal. It, therefore, follows that if imports are at the level indicated above, an additional fertiliser programme to the extent of about 300,000 tons can be undertaken by the end of the Plan. It is proposed to work out programmes for the utilisation of additional quantities of fertilisers. Some increase in production as a result of the increased use of organic manures which are locally available and constitute one of the most important items of rural extension work is also expected, but a quantitative estimate is not at present possible.

COMMERCIAL CROPS

10. Production programmes for commercial crops and, in particular, for cotton and jute are more recent than those for food crops. Programmes prepared for individual crops sometimes overlook the fact that, except for the price factor, the basic conditions which favour increase in production in one direction also favour increase in production in others. Agricultural production in any area should, therefore, always be viewed and planned for as one whole. Administratively, production programmes for commercial crops have not yet been fully integrated with those relating to food crops. In respect of programmes for commercial crops, the Central Government are guided mainly by the views of commodity committees for cotton, jute, sugarcane, and oil seeds. The commodity committees for cotton and oil seeds derive their resources from special cesses while finance for sugarcane is provided from excise funds. These Committees are expected to finance the production programmes during the period of the Plan as follows:—

Cotton	.	.	.	.	.	3·5 crores.
Sugarcane	.	.	.	.	.	1·3 crores.
Oilseeds	.	.	.	.	.	0·5 crores.

For jute there is no separate cess and the Plan provides a sum of Rs. 50 lakhs. The break-up of the targets by States for commercial crops has been given in Appendix II.

11. Production targets for commercial crops which were worked out in the summer of 1951 and were re-assessed early this year assume the continuance, broadly speaking, of the structure of relative prices between foodgrains and other crops which prevailed at the time. It is obvious that the production of these crops is influenced by price changes to a much greater extent than food production. It is, therefore, important to stress that during the period of the Plan any attempt to offer price incentives of a varying order for different crops should be avoided. Secondly, the maintenance of adequate degree of control over the prices of different agricultural commodities continues to be the essential condition of all agricultural planning. Here it is sufficient to state that excessive price stimuli in favour of some crops, either through deliberate alteration of prices or through relaxation of controls, may frequently have the effect of jeopardising the achievement of the agricultural targets under the Five Year Plan. Price policy remains therefore, a pre-eminent factor in the fulfilment of the agricultural plan.

OTHER AGRICULTURAL PRODUCTS

12. Besides foodgrains, oil-seeds and sugar-cane, the production of fruits, vegetables, fish, milk and dairy products, which constitute important elements in the diet of the people, has to be systematically encouraged. Proposals relating to the production of fish, milk, and dairy products are described in subsequent chapters. It is considered that fish production might increase by about 50 per cent., from 1.0 million tons in 1950-51 to 1.5 million tons in 1955-56. Milk yields may increase by about 20 per cent., as a result of improvement in the breed of cattle and increase in the availability of fodder and feeds. Schemes for increasing the production of fruits and vegetables and other subsidiary foods *e.g.*, potatoes and tapioca figure in the programmes of some of the States and also qualify for assistance from the Centre as 'Grow More Food' schemes. It is not, however, possible to assess precisely the cumulative effect of these schemes. With the establishment of an adequate extension service, the implementation of these schemes may be expected to become more sustained than it is at present.

THE EFFECT OF THE PROGRAMME

13. It is difficult to forecast the effect of the agricultural programme on the crop pattern with any degree of precision. This is due to the fact that the decision of the cultivator to raise a crop is based on factors like prices, weather conditions, availability of capital resources, and supplies which vary from season to season. Even areas under rice and wheat may be diverted to crops like sugar cane, fruits and vegetables when irrigation is provided. Sugar-cane, cotton and jute afford recent examples of the effect of prices on the crop pattern. Improvement in transport facilities, growth of urban areas, changes in food habits also at times affect the acreage under different crops. The influence that each one of these factors

exercises has to be studied in detail so that some basis for making estimates might become available. On the basis of the material available to us and taking into account the fact that the cropped and irrigated areas are likely to increase by 10* and 20 million acres respectively, the following pattern of crops may be anticipated at the end of the period of the Plan.

	(Area in million acres)	
	1950-51	1955-56
Rice	76.0	80.0
Wheat	24.0	27.0
Other cereals	93.0	90.0
Gram and pulses	47.2	49.0
Cotton	14.6	18.0
Jute	1.4	2.0
Sugarcane	4.2	4.5
Oil seeds	26.7	27.0
Fruits and vegetables	5.0	6.0
Other crops	25.0	24.0
TOTAL	317.1	327.5

AGRICULTURAL PLANNING

14. In presenting the programmes described in this chapter, it may be useful to say a word about some of the implications of agricultural planning. The national targets of additional production or targets proposed for individual States indicate in a broad way the magnitude of the effort that is contemplated. They are of material assistance in laying down overall policies concerning prices of agricultural commodities and the allocation of resources for different programmes. They are, however, no more than a starting point for the actual planning which has to be done at different levels, from the village upwards. Agricultural production is subject to so many hazards that under the most favourable conditions any targets that may be proposed are essentially rough estimates which may be realised if certain assumptions hold good. In each State the targets have to be broken up by districts and, within each district, by *tahsils* or *taluks*. Where the programmes already contemplated do not seem to promise the desired results, provided the necessary potential is available, these programmes should be suitably expanded or supplemented. Detailed agricultural planning will be possible in areas in which intensive development is undertaken through the rural extension service, for instance, in community project areas. In these areas special stress is to be laid on building up the village agency for development and on strengthening the co-operative movement. For an area as small as a development block, on the basis of local knowledge and experience, it should be possible to frame production programmes and provide for positive measures to ensure their fulfilment subject, of course, to circumstances such as failure of rainfall or floods.

*This includes 7.4 million acres of reclaimed area and anticipated increase of three million acres in double cropped area.

15. Within the development block production has to be guided and aided in the main through the agency of the village body concerned with development. As a rule, it is unlikely that there is much to be gained by attempting to fix areas or proportions of individual holdings for particular crops. On the whole, it is best that each farm and each village should follow the crop plan which will enable it to utilize the available physical resources to the greatest advantage. Removal of large disparities between the return on the main competing crops is an obligation of overall policy rather than of detailed agricultural planning. To the extent to which individual farms join into co-operatives, crop planning will become the means, not merely for regulating production, but also for expanding it to the greatest extent possible. The first stage in developing an adequate structure for agricultural planning may be to carry the targets at least as far as individual development blocks where intensive work is undertaken, and in a less detailed manner, as far as tahsils and taluks. After some years of intensive development and experiment it should become possible to ensure that agricultural targets in each State and for the country as a whole are related, on the one hand, to obligations which individual farms and villages accept and, on the other, to the goals of national agricultural policy.

APPENDIX I
TARGETS OF ADDITIONAL PRODUCTION 1955-56
(Foodgrains)
(para 7)

(In 000' tons)

State	Major irrigation	Minor irrigation	Land reclama- tion and develop- ment	Fertilizers and manures	Improved seeds	Total
I	2	3	4	5	6	7
<i>Part 'A' States—</i>						
1. Assam . . .	77.0	104.0	25.0	4.0	45.9	255.9
2. Bihar . . .	123.0	353.3	166.3	133.3	included. under Col (5)	775.9
3. Bombay . . .	94.5	86.8	76.0	65.9	53.3	376.5
4. Madhya Pradesh . . .	23.1	25.7	214.5	15.2	2.5	281.0
5. Madras . . .	205.9	286.5	81.2	174.4	142.0	890.0
6. Orissa . . .	52.6	86.4	63.3	43.3	14.0	259.6
7. Punjab . . .	371.1	32.8	11.7	4.6	43.6	463.8
8. Uttar Pradesh . . .	386.0	209.0	300.0	28.0	60.0	983.0
9. West Bengal . . .	314.9	183.2	22.6	20.4	12.0	553.1
TOTAL . . .	1648.1	1367.7	960.6	489.1	373.3	4838.8
<i>Part 'B' States—</i>						
10. Hyderabad . . .	41.4	196.4	255.0	48.9	82.8	624.5
11. Madhya Bharat . . .	10.0	4.4	113.8	13.6	26.3	168.1
12. Mysore . . .	11.0	35.2	23.5	11.7	16.1	97.5
13. Pepsu . . .	62.2	57.0	32.5	2.8	16.0	170.5
14. Rajasthan . . .	153.3	23.3	2.3	4.1	3.0	186.0
15. Saurashtra . . .	40.7	31.7	0.3	8.6	1.0	82.3
16. Travancore-Cochin . . .	42.0	7.5	14.3	52.5	14.8	131.1
TOTAL . . .	360.6	355.5	441.7	142.2	160.0	1460.0
<i>Part 'C' States—</i>						
17. Ajmer . . .	..	4.7	..	5.1	2.7	12.5
18. Bhopal . . .	..	20.6	74.2	3.0	6.0	103.8
19. Bilaspur . . .	..	2.9	0.5	1.2	0.1	4.7
20. Coorg . . .	..	2.0	1.0	..	..	3.0
21. Delhi . . .	..	1.7	1.3	0.4	1.1	4.5
22. Himachal Pradesh . . .	..	20.0	13.0	0.3	11.1	44.4
23. Kutch . . .	..	5.5	..	0.2	*	5.7
24. Tripura . . .	..	0.2	..	0.2	1.9	2.3
25. Vindhya Pradesh . . .	..	3.6	20.2	6.2	0.4	30.4
TOTAL . . .	..	61.2	110.2	16.6	23.3	211.3
Total State Schemes . . .	2008.7	1784.4	1512.5	647.9	556.6	6510.1
Supplementary Schemes . . .	..	600.0	..	500.0	..	1600.0†
GRAND TOTAL—Gross tar- get (Indian Union) . . .	2008.7	2384.4	1512.5	1147.9	556.6	8110.1†
Less on account of diver- sion to commercial crops						(—)500.0
Net target of foodgrains (Indian Union) . . .						7610.1

* Less than 50 tons.

† Includes 0.5 million tons on account of community projects and intensive areas.

APPENDIX

TARGETS OF ADDITIONAL
(Commercial

State	Cotton (ooo' bales)			Per cent increase over 1950-51	Jute (ooo' bales)	
	Production in 1950-51	Additional Production during 1951-56	Production during 1955-56 (Col. 2+3)		Production in 1950-51	Additional Production during 1951-56
I	2	3	4	5	6	7
1. Assam . . .	12	..	12	..	809	225
2. Bihar . . .	3	..	3	..	658	390
3. Bombay . . .	803	275	1078	34	..	..
4. Madhya Pradesh . . .	510	170	680	33	..	..
5. Madras . . .	348	180	528	52	..	..
6. Orissa . . .	2	..	2	..	242	200
7. Punjab . . .	196	150	346	78	..	..
8. Uttar Pradesh . . .	45	40	85	89	49	250
9. West Bengal . . .	..	..	..	..	1496	1000
10. Hyderabad . . .	260	200	460	77	..	..
11. Pepsu . . .	175	80	255	46	..	..
12. Rajasthan . . .	114	50	164	44	..	..
13. Madhya Bharat . . .	219	92	311	42	..	..
14. Mysore . . .	33	8	41	24	..	..
15. Saurashtra . . .	216	6	222	3	..	..
16. Bhopal . . .	4	6	10	150	..	..
17. Delhi . . .	..	..	..	..	..	..
18. Vindhya Pradesh . . .	..	..	..	..	..	..
19. Kutch . . .	4	1	5	25	..	..
20. Tripura . . .	..	..	..	..	47	25
21. Other States . . .	27	..	27	..	..	..
22. Indian Union . . .	2971	1258	4229	42	3301	2090

II

PRODUCTION 1955-56
(Crops)

Sugarcane (ooo' tons)					Oilseeds (ooo' tons)				
Production during 1955-56 (Col. 6 +7)	Per cent. increase over 1950-51	Production in 1950-51	Additional Production during 1951-56	Production during 1955-56 (Col. 10 +11)	Per cent. increase over 1950-51	Production in 1950-51	Additional Production during 1951-56	Production during 1955-56 (Col. 14 +15)	Per cent. increase over 1950-51
8	9	10	11	12	13	14	15	16	17
1034	28	68	..	68	..	55	..	55	..
1048	59	309	50	359	16	60	..	60	..
..	..	543	87	630	16	745	10	755	1
..	..	54	..	54	..	241	10	251	4
..	..	716	80	796	11	1833	100	1933	5
442	83	109	..	109	..	73	4	77	5
..	..	364	70	434	19	89	4	93	4
299	510	2903	400	3303	14	767	61	828	8
2496	67	96	..	86	..	55	5	60	9
..	..	191	..	191	..	498	150	648	30
..	..	73	7	80	9	21	1	22	5
..	..	16	..	16	..	114	16	130	14
..	..	36	..	36	..	152	25	177	16
..	..	76	..	76	..	74	5	79	7
..	..	48	..	48	..	247	1	248	..
..	..	8	4.6	12.6	57	10	4	14	40
..	..	2	0.2	2.2	10	..	..	..	..
..	..	5	1.2	6.2	24	49	3	52	5
..	..	1	..	1	..	1	1	2	100
72	53	6	..	6	..	3	..	3	..
..	..	2	..	2	..	16	..	16	..
5391	63	5616	700	6316	12	5103	400	5503	8

THE FIRST FIVE YEAR PLAN

APPENDIX III

IRRIGATION PROGRAMME

(para 7)

(In 000' acres)

State	Cultivated area (1949-50)	Irrigated area (1949-50)	Extension of irrigation during the Plan period			Area to be under irrigation in 1955-56 (Colm. 3 + Colm. 6)	Irrigated area as Percentage of cultivated area		Percentage increase in irrigated area (Col. 6 over Col. 3)	State's share in the total increase (percentage of figures in Colm. 6 to the total)
			Minor	Major	Total		1949-50 (Col. 3 over Col. 2)	1955-56 (Col. 7 over Col. 2)		
I	2	3	4	5	6	7	8	9	10	11
Assam . . .	7,309	1,327	770	218	988	2,315	18.2	31.7	74.4	5.9
Bihar . . .	27,585	5,595	2,086	675	2,761	8,356	20.3	30.3	49.3	16.5
Bombay . . .	48,124	1,761	582	474	1,056	2,817	3.7	5.9	60.0	6.3
Madhya Pradesh . . .	33,375	1,691	86	114	200	1,891	5.1	5.7	11.9	1.2
Madras . . .	41,024	9,850	556	435	991	10,841	24.0	26.4	10.1	5.9
Orissa . . .	7,528	1,672	434	741	1,175	2,847	22.2	37.8	70.2	7.0
Punjab . . .	13,828	4,790	243	1,547	1,790	6,580	34.6	47.6	37.4	10.7
Uttar Pradesh . . .	42,331	10,878	1,110	1,361	2,471	13,349	25.7	31.5	22.7	14.8
West Bengal . . .	12,879	2,329	933	1,512	2,445	4,774	18.1	37.1	105.0	14.6
TOTAL PART 'A' STATES	233,983	39,893	6,800	7,077	13,877	53,770	17.1	23.0	34.8	82.9
Hyderabad . . .	37,183	1,488	330	306	636	2,124	4.0	5.7	42.7	3.8
Jammu & Kashmir . . .	1,962	701	...	...	...	701	35.7	35.7	...	...
Madhya Bharat . . .	11,861	462	40	83	123	585	3.9	4.9	26.6	0.7
Mysore . . .	8,263	1,152	169	30	199	1,351	13.9	16.3	17.0	1.2
PEPSU . . .	4,991	1,845	310	243	553	2,398	37.0	48.0	30.0	3.3
Rajasthan . . .	11,247	1,503	193	480	673	2,176	13.4	19.3	45.0	4.0
Saurashtra . . .	7,044	315	105	108	213	528	4.5	7.5	67.5	1.3
Travancore-Cochin . . .	2,897	940	30	17	55	995	32.4	34.3	5.9	0.4
TOTAL PART 'B' STATES	85,448	8,406	1,185	1,267	2,452	10,858	9.8	12.7	29.2	14.7
Aimer . . .	616	117	7	...	7	124	19.0	20.1	6.0	...
Bhopal . . .	1,658	17	59	...	59	76	1.0	4.6	347.1	0.3
Bilaspur . . .	90	5	10	...	10	15	5.6	16.7	200.0	0.1
Coorg . . .	205	7	...	...	...	7	3.4	3.4	...	...
Delhi . . .	236	68	13	...	13	81	28.8	34.3	19.1	0.1
Himachal Pradesh . . .	622	135	83	75	158	293	21.7	47.1	117.0	1.0
Kutch . . .	2,207	69	110	38	148	217	3.1	9.8	214.5	0.9
Tripura . . .	401	...	2	...	2	2	...	0.5	...	...
Vindhya Pradesh . . .	5,108	196	9	...	9	205	3.8	4.0	4.6	...
TOTAL PART 'C' STATES	11,143	614	293	113	406	1020	5.5	9.1	65.8	2.4
GRAND TOTAL	330,574	48,913	8,278	8,457	16,735	65,648	14.8	19.9	34.2	100.0

APPENDIX IV

FIVE YEAR PROGRAMME

*Minor Irrigation Works area benefited**(para 7)**(In 000' acres)*

State	New Wells	Old Wells	Tube-Wells	Tanks	Pumping installation on rivers	Pumping installation on wells	Dams, Channels etc.	Total
I	2	3	4	5	6	7	8	9
1. Assam . . . .	...	...	...	...	2.5	...	767.0	769.5
2. Bihar	106.3	...	172.0	...	138.0	89.0	1581.0	2086.3
3. Bombay	128.0	...	8.7	203.0	27.0	...	215.1	581.8
4. Madhya Pradesh	22.8	6.0	...	20.7	12.6	2.9	20.8	85.8
5. Madras	31.9	...	43.2	150.0	25.0	199.4	107.0	556.5
6. Orissa . . . .	...	...	...	...	...	3.0	431.0	434.0
7. Punjab	27.0	6.0	180.0	...	...	30.0	...	243.0
8. Uttar Pradesh	457.5	392.5	105.0	...	1.7	...	154.0	1110.7
9. West Bengal . . . .	...	...	...	168.0	65.0	...	700.0	933.0
10. Hyderabad	39.0	9.0	...	107.8	...	22.9	151.8	330.5
11. Madhya Bharat	17.6	10.1	...	...	...	12.2	...	39.9
12. Mysore	13.2	...	...	25.0	...	7.8	123.0	169.0
13. PEPSU	102.3	55.7	84.0	...	...	63.2	5.0	310.2
14. Rajasthan	80.0	25.6	43.0	40.5	...	3.6	...	192.7
15. Saurashtra	40.0	20.0	...	...	...	...	45.0	105.0
16. Travancore-Cochin	4.5	...	...	5.5	23.0	4.6	...	37.6
17. Ajmer	0.3	6.9	...	...	...	...	...	7.2
18. Bhopal	0.6	7.2	15.0	9.0	7.2	...	19.5	58.5
19. Bilaspur . . . .	...	...	...	...	...	...	10.0	10.0
20. Delhi	8.8	0.2	...	...	2.0	...	2.0	15.0
21. Himachal Pradesh	2.0	...	...	...	1.8	...	70.0	83.0
22. Kutch	20.0	4.8	...	37.8	2.0	...	45.2	109.8
23. Tripura . . . .	...	...	...	2.3	...	...	...	2.3
24. Vindhya Pradesh	1.2	...	...	...	4.0	2.6	1.4	9.2
TOTAL	1103.0	544.0	660.1	769.6	311.8	441.2	4448.8	8278.5

THE FIRST FIVE YEAR PLAN

APPENDIX V

FIVE YEAR PROGRAMME

Land Reclamation and Development

										(In 000' acres)	
Reclamation by										Land Development	
State		Central Tractor Organ- isation	State Tractor Organ- isation	Private parties with State help	Other means including fallows	Total		Bunding, drainage etc.	Mechanical cultivation		
I		2	3	4	5	6		7	8		
Assam	. . . . .	...	...	...	...	...		358.5	130.0	
Bihar	. . . . .	...	45.0	...	180.0	225.0		639.0	...	
Bombay	. . . . .	...	10.0	...	...	10.0		1005.4	1635.6	
Madhya Pradesh	. . . . .	474.0	378.9	339.0	1000.0*	2191.9		106.7	45.0	
Madras	. . . . .	...	...	198.5	...	198.5		47.4	565.0	
Orissa	. . . . .	...	175.6	150.0	...	325.6		...	...
Punjab	. . . . .	...	50.0	...	...	50.0		97.5	25.0	
Uttar Pradesh	. . . . .	238.0	162.0	125.0	...	525.0		300.0	..	
West Bengal	. . . . .	...	68.0	48.3	...	116.3		...	19.9	
TOTAL PART 'A' STATES	. . . . .	712.0	889.5	860.8	1180.0	3642.3		2554.5	2375.5	
Hyderabad	. . . . .	...	92.4	64.0	2000.0*	2156.4		...	154.0	
Madhya Bharat	. . . . .	300.0	100.0	30.0	370.0	800.0		17.4	10.0	
Mysore	. . . . .	...	13.2	...	...	13.2		7.4	150.0	
PEPSU	. . . . .	...	68.3	76.0	65.7	210.0		130.0	566.2	
Saurashtra	. . . . .	...	...	...	...	...		13.7	...	
Travancore-Cochin	. . . . .	...	...	...	50.0	50.0		...	...
TOTAL PART 'B' STATES	. . . . .	300.0	273.9	170.0	2485.7	3229.6		168.5	880.2	
Bhopal	. . . . .	400.0	14.0	...	2.5	416.5		160.0	30.7	
Bilaspur	. . . . .	...	...	1.0	0.4	1.4		...	...
Delhi	. . . . .	...	1.7	...	5.0	6.7		9.1	4.0	
Himachal Pradesh	. . . . .	...	...	...	...	...		64.8	...	
Kutch	. . . . .	...	...	...	...	...		8.0	20.0	
Vindhya Pradesh	. . . . .	4.0	20.0	44.8	16.0	84.8		68.0	72.4	
TOTAL PART 'C' STATES	. . . . .	404.0	35.7	45.8	23.9	509.4		309.9	127.1	
TOTAL INDIAN UNION	. . . . .	1416.0	1199.1	1076.6	3689.6	7381.3		3032.9	3427.8	

*These areas represent fallow lands which will be brought under cultivation.

CHAPTER XV

COMMUNITY DEVELOPMENT AND RURAL EXTENSION

I. BASIC PRINCIPLES

COMMUNITY DEVELOPMENT is the method and Rural Extension the agency through which the Five Year Plan seeks to initiate a process of transformation of the social and economic life of the villages. The Plan provides Rs. 90 crores for community projects and proposes the establishment over a period of about ten years of a network of extension workers throughout the country. The object of this chapter is to indicate briefly the significance of the two programmes and their place in national reconstruction.

2. For some three decades rural development work has been undertaken by different branches of the administration in the States. Until a few years ago, the expenditure on development was meagre and rural development work was thought of largely in terms of particular items of improvement in village life and in agricultural practice, and special attention was given, for instance, to the number of wells sunk or repaired, the supply of irrigation or drinking water, the supply of seeds or fertilisers, the number of manure pits dug, the starting of rural credit societies etc. These are essential items in any rural programme, but there was no co-ordinated approach to village life as a whole.

3. If one goes back to the study of the efforts made before World War II in individual Provinces and States and considers the experience gained in later years in Sevagram in Madhya Pradesh, in the Firka Development scheme in Madras, in the Sarvodaya centres in Bombay, in Etawah and Gorakhpur in Uttar Pradesh and other centres which are perhaps less well known, certain broad conclusions emerge. These are :

(i) When different departments of the Government approach the villager, each from the aspect of its own work, the effect on the villager is apt to be confusing and no permanent impression is created. The peasant's life is not cut into segments in the way the Government's activities are apt to be ; the approach to the villager has, therefore, to be a co-ordinated one and has to comprehend his whole life. Such an approach has to be made, not through a multiplicity of departmental officials, but through an agent common at least to the principal departments engaged in rural work, whom it is now customary to describe as the village level worker.

(ii) Programmes which have been built on the co-operation of the people have more chances of abiding success than those which are forced down on them.

(iii) While the official machinery has to guide and assist, the principal responsibility for improving their own condition must rest with the people themselves. Unless they feel that a programme is theirs and value it as a practical contribution to their own welfare, no substantial results will be gained.

(iv) Programmes largely dependent on expenditure by the Government, in which the elements of self-help and mutual co-operation on the part of villagers are present only in a nominal degree are shortlived. The essential idea should be the reduction of chronic unemployment which is a feature of rural life, through the practice of scientific agriculture and cottage and small-scale industries.

(v) Advice and precept are of no avail unless they are backed by practical aids—supplies of seed and fertiliser, finance and technical guidance for solving the farmer's immediate problems.

(vi) Whatever the measure of the effort which the Government wishes to make, the best results will be gained if the programmes are pursued intensively, and practically every agriculturist family has its own contribution to make through a village organisation.

(vii) The approach to the villager would be in terms of his own experience and problems, conceived on the pattern of simplicity, avoiding elaborate techniques and equipment until he is ready for them.

(viii) There has to be a dominant purpose around which the enthusiasm of the people can be aroused and sustained, a purpose which can draw forth from the people and those who assist them on behalf of the Government the will to work as well as a sense of urgency. The aim should be to create in the rural population a burning desire for a higher standard of living—a will to live better.

II. COMMUNITY DEVELOPMENT PROGRAMME

These lessons from the experience of the past have been brought together in the conception and concrete formulation of the community development programme, which has been launched during 1952. While the concept is not a new one, progress has in the past been hampered by insufficiency of available funds.

Size of the unit

2. For each community project, as at present planned, there will be approximately 300 villages with a total area of about 450 to 500 square miles, a cultivated area of about 150,000 acres and a population of about 200,000. The project area is conceived as being divided into 3 Development Blocks, each consisting of about 100 villages and a population of about 60,000 to 70,000. The Development Block is, in turn, divided into groups of 5 villages each, each group being the field of operation for a village level worker.

Location of Units

3. The initial programme has been started with approximately 55 Projects of rural development located in selected areas in the several States of India. A certain degree of flexibility is allowed in the actual allotment of projects. Thus, while many are complete projects of about 300 villages each, some are also independent development blocks of about 100 villages each, depending upon the needs and conditions of the particular areas chosen for development.

4. As increased agricultural production is the most urgent objective, one of the basic criteria in the selection of this first set of Project areas has been the existence of irrigation facilities or assured rainfall. In assessing irrigation facilities and the possibilities of development, irrigation from river valley projects, from tubewells, as well as from minor irrigation works, have been taken into account. In States like West Bengal and Punjab, with a large population of displaced persons, the selection of project areas aims also at helping the resettlement of these persons. Seven areas have been selected on the ground of their being inhabited predominantly by scheduled tribes. In every field of activity, whether social or economic, urban and rural development are complementary, for, neither towns nor villages can advance alone. Where the existing urban facilities are inadequate or where large numbers of displaced persons have to be rehabilitated, the intention is that the urban development should take the form of new townships. Six such projects have been proposed to be taken up under the current programme.

Under such rural-cum-urban development, new towns will come into existence to serve as centres which will draw sustenance from the surrounding countryside and, in return, carry to it new amenities and the spirit of a developing and changing economy. The creation of new centres of small-scale industrial production, closely coordinated with rural development, is fundamental to national development, for in no other way can the present occupational imbalance between agriculture and industry, between village and town, be corrected. With the development of power resources and of communications and the growth of basic industries, the scope for establishing such centres will steadily increase and, as the economy develops, this programme will gain in importance. During the first few years, however, it is inevitable that by far the greatest stress in community development, as indeed in national planning, should be on rural areas. The intensive development of agriculture, the extension of irrigation, rural electrification and the revival of village industries, wherever possible, with the help of improved techniques, accompanied by land reform and a revitalised co-operative movement, are programmes closely related to one another, and together calculated to change the face of the rural economy.

Main lines of activity

5. The main lines of activity which will be undertaken in a community project, can be briefly divided into the following :

Agriculture and related matters.

Irrigation.

Communications.

Education.

Health.

Supplementary employment.

Housing.

Training.

Social Welfare.

Agriculture and related matters

6. The programme includes reclamation of available virgin and waste land ; provision of commercial fertilizers and improved seeds ; the promotion of fruit and vegetable cultivation, of improved agricultural technique and land utilisation ; supply of technical information, improved agricultural implements, improved marketing and credit facilities ; provision of soil surveys and prevention of soil erosion ; encouragement of the use of natural and compost manures and improvement of livestock, the principal emphasis here being on the establishment of key villages for breeding pedigree stock and the provision of veterinary aid, as well as artificial insemination centres. For attaining this objective, agricultural extension service will be provided at the rate of one agricultural extension worker for every 5 villages.

One of the important functions of the agricultural extension worker will be to encourage the growth of a healthy co-operative movement. The aim will be to see that there is at least one multi-purpose society in every village or group of villages on which practically every agriculturist family is represented.

It is expected "that the co-operative principle, in its infinitely varying forms, will be capable of adaptation for finding a solution to all problems of rural life." Multi-purpose societies will therefore have to be used for practically every development activity in the community project area, including the encouragement of rural arts and crafts.

Irrigation

7. The programme visualises provision of water for agriculture through minor irrigation works, *e.g.*, tanks, canals, surface wells, tubewells, etc., the intention being that at least half of the agricultural land, if possible, be served with irrigation facilities.

Communications

8. The road system on the countryside is to be so developed as to link every village within the Project area upto a maximum distance of half a mile from the village, the latter distance being connected by feeder roads through voluntary labour of the villagers themselves, only the main roads being provided for and maintained by the State or other public agencies.

Education

9. It has been realised that the full development of a community cannot be achieved without a strong educational base, alike for men and women. The community projects have been planned to provide for social education, expansion and improvement of primary and secondary education and its gradual conversion to basic type, educational facilities for working children and promotion of youth welfare.

Vocational and technical training will be emphasised in all the stages of the educational programme. Training facilities will be provided for imparting improved techniques to existing artisans and technicians, both in urban and rural areas. Training centres which already exist in any area, will be strengthened and developed, and new ones established to meet the requirements of the project area.

Health

10. The Health Organisation of the Project area will consist of 3 primary health units in the Development Blocks and a secondary health unit equipped with a hospital and a mobile dispensary at the headquarters of the Project area and serving the area as a whole. It would aim at the improvement of environmental hygiene, including provision and protection of water supply ; proper disposal of human and animal wastes ; control of epidemic diseases, such as malaria, cholera, small-pox, tuberculosis, etc. ; provision of medical aid along with appropriate preventive measures, and education of the population in hygienic living and improved nutrition.

Supplementary employment

11. The unemployed and the under-employed persons in the village community will be provided with gainful employment to such extent as is possible, by the development of cottage and small-scale industries, construction of brick kilns and saw mills and encouragement of employment through participation in the tertiary sector of the economy.

Housing

12. Apart from the provision of housing for community projects personnel, steps will be taken, wherever possible, to provide demonstration and training in improved techniques and designs for rural housing. In congested villages, action in the direction of development of new sites, opening of village parks and playgrounds and assistance in the supply of building materials, may also be necessary.

Training

13. The training of village level workers, project supervisors and other personnel for the Community Development Programme will be carried out in 30 training centres which have been set up with the assistance of the Ford Foundation of America. Each training centre will have facilities for about 70 trainees. Each centre will have double training staff so that the trainees can be divided into two groups. One group will have practical and supervisory work experience, while the other group will utilise the centres' facilities for lectures, demonstrations and discussions. In view of the great demand on the training centres to turn out people quickly for the opening of new projects, the training period will, in the first instance, be limited to six months.

In addition to the training of village level workers and supervisors, the agricultural extension service workers in the Project areas will take steps for the training of the agriculturists, panches and village leaders.

Social welfare

14. There will be provision for audio-visual aid for instruction and recreation, for organisation of community entertainment, sports activities and Melas.

Organisation

15. *Centre*—For the implementation of the Community Development Programme, as indicated above, the Central Organisation will consist of a Central Committee (the Planning Commission has been designated as the Central Committee) to lay down the broad policies and provide general supervision, and an Administrator of Community Projects under the Central Committee. The Administrator will be responsible for planning, directing and co-ordinating the Community Projects throughout India under the general supervision of the Central Committee and in consultation with appropriate authorities in the various States. He will be assisted by a highly qualified executive staff to advise him on administration, finance, personnel, community planning and other matters.

16. *State*—At the State level, there will be a State Development Committee or a similar body consisting of the Chief Minister and such other Ministers as he may consider necessary. There will also be a State Development Commissioner or a similar official who will act as the Secretary to the State Development Committee and will be responsible for directing community projects in the State. Where the work justifies it, there may, in addition, be a Deputy Development Commissioner specifically in charge of community projects.

17. *District*—At the District level, there will be, wherever necessary, a District Development Officer responsible for the Community Development Programme in the district. This officer will have the status of an Additional Collector and will operate under the directions of the Development Commissioner. He will be advised by a District Development Board consisting of the officers of the various departments concerned with Community Development, with the Collector as Chairman and the District Development Officer as executive Secretary.

18. *Project*—At the Project level, each individual project unit (consisting of a full project or one or more Development Blocks where there is not a full project) will be in charge of a Project Executive Officer. In the selection of Project Executive Officers, special regard will be paid to experience, general outlook, understanding of the needs and methods of Community Development, capacity for leadership and ability to secure both official and non-official co-operation. Each Project Executive Officer in charge of a full project, will have on his staff approximately 125 supervisors and village level workers, who will be responsible for the successful operation of all activities at the Project Level.

This organisational pattern will be adapted to suit local conditions and needs as may be deemed necessary by the Administrator and the respective State Governments.

People's participation—the crux of the programme

19. While on the subject of organisation, it is necessary to stress the importance of ensuring, right from the start, the people's participation, not merely in the execution of the Community Development Project but also in its planning. This in fact is the very essence of the programme.

20. The Community Development Programme aims at the establishment of a suitable organ to ensure participation of the villagers at the planning stage. It contains provisions for the setting up of a Project Advisory Committee. It is intended that the Project Advisory Committee should be as representative as possible of all the non-official elements within the project area.

In securing participation of the villagers in the execution of the programme, the Community Projects Organisation will avail of all non-official local voluntary organisations and especially the Bharat Sevak Samaj, which is likely to be set up in the project area on the lines indicated in the pamphlet recently circulated by the Planning Commission.

Villager's contribution to the programme

21. The pattern of the project as drawn up includes major items of works normally implemented through Government agencies. This is bound to involve higher expenditure through elaborate administrative staff, middlemen's fees and possibly in certain cases, questionable practices. If the people are to be trained to be the builders of the future, the works have to be entrusted, even at certain risks, to the people themselves through their representative agencies, the Governmental organisation furnishing the technical assistance and the essential finance. It is intended that a qualifying scale of voluntary contribution, either in the form of money or of labour, should be laid down and this contribution will be a condition precedent to development schemes being undertaken under the Community Development Programme.

In all these cases, contributions may be in the form, either of voluntary labour or of cash. In respect of backward areas and areas predominantly populated by scheduled castes and scheduled tribes it may not be possible for the villagers to make any financial contribution. In these areas, the villagers should be asked to contribute by way of labour effort required for executing the works programme under various heads. The agency of the Bharat Sevak Samaj is hoped to become a major avenue for the organisation of the voluntary effort on the part of the villagers.

Finance

22. The estimated expenditure on a basic type of a rural community project, *i.e.*, a project without the provision for an urban unit, is Rs. 65 lakhs over a period of 3 years. Of this amount, about 58.47 lakhs will be rupee expenditure, and Rs. 6.53 lakhs will be dollar expenditure.

The estimated cost of an urban unit (which it is intended to provide in a few projects) is Rs. 111 lakhs. Of this amount, the estimated rupee expenditure is about Rs. 95.55 lakhs and the dollar expenditure is Rs. 15.45 lakhs.

In order to enable expansion of the programme in future years, the Central Committee felt that some reduction in the estimated cost of a rural community project, basic type, should be made and, after examination of the question, has now decided that all community projects

should be operated on the basis of a reduced total of Rs. 45 lakhs per project. So far as the existing projects are concerned, this would mean that the area of operations under each project on a population basis of 2 lakhs per project should be so revised or adjusted as to conform to the new expenditure pattern.

The Community Development Programme imposes financial obligations on the Centre as well as on the State Governments. Broadly, the proportions which have been fixed are 75 per cent for the Centre and 25 per cent for the State in respect of non-recurring expenditure, and 50 per cent each for Centre and States in respect of recurring expenditure. This applies to 'grants-in-aid'. Loan amount is totally found by the Centre. After the three-year period, the Community Project areas are intended to become Development Blocks on the lines recommended for adoption in Chapter VI of the Grow More Food Enquiry Committee's Report. It is expected that in so far as the Community Project areas are concerned, the expenses of such development blocks will be borne entirely by State Governments after the third year. The expenditure, mostly recurring, is likely to be about Rs. 3 lakhs per project.

Supporting projects

23. The Community Development Programme is related to and supported in part by most of the other projects under the Indo-American Technical Co-operation Programme. The fertiliser required by the Community Development Programmes will be acquired and distributed in accordance with the Operational Agreement No. 1 which deals with the "Project for Acquisition and Distribution of Fertilizer". Similarly, the iron and steel needed for farm implements and tools will be acquired and distributed in accordance with the "Project for the Acquisition and Distribution of Iron and Steel for Agricultural purposes". The tubewells to be constructed in the project areas will be allocated from the "Project for Ground Water Irrigation". Information and services with respect to soils and fertilizer application will be made available from the "Project for distribution of soil fertility and fertiliser use". Assistance in Malaria control in the project areas will be forthcoming from the "Project for malaria control planned under the Technical Co-operation Programme". The training of Village Level Workers and Project Supervisors will be carried out under the "Village Workers Training Programme".

Evaluation

24. A systematic evaluation of the methods and results of the Community Development Programme will, no doubt, make a significant contribution by pointing up those methods which are proving effective, and those which are not ; and furnishing an insight into the impact of the Community Development Programme upon the economy and culture of India. In order that it may be useful to those administering the Community Development Projects and serve as a basis for informed public opinion regarding the programme, the evaluation work is being arranged to be conducted by the Planning Commission in close co-operation with the Ford Foundation and the Technical Co-operation Administration.

III. NATIONAL EXTENSION SERVICE

In setting out our proposals on the subject of administration of district development programmes, we have already attempted to analyse the organisational features of extension work in the district. The entire subject has been carefully reviewed recently by the Grow More Food Enquiry Committee. After examining the results of the campaign for increased food production, which has been in progress for several years, the Committee state the problem which extension workers have to meet in the following words :

“No plan can have any chance of success unless the millions of small farmers in the country accept its objective, share in its making, regard it as their own, and are prepared to make the sacrifices necessary for implementing it. The integrated production programme has failed to arouse enthusiasm for the reasons we have given. The food problem is a much wider one than mere elimination of food imports. It is the problem of bringing about such a large expansion of agricultural production as will assure to an increasing population progressively rising levels of nutrition. In other words, the campaign for food production should be conceived as part of a plan for the most efficient use of land resources by the application of modern scientific research and the evolution of a diversified economy. In its turn, agricultural improvement is an integral part of the much wider problem of raising the level of rural life. The economic aspects of village life cannot be detached from the broader social aspects ; and agricultural improvement is inextricably linked up with a whole set of social problems. The lesson to be derived from the working of the G. M. F. programmes thus confirms the experience of States and private agencies engaged in village development. It is that all aspects of rural life are interrelated and that no lasting results can be achieved if individual aspects of it are dealt with in isolation. This does not mean that particular problems should not be given prominence but the plans for them should form parts of, and be integrated with, those for achieving the wider aims. It is only by placing this ideal—of bringing about an appreciable improvement in the standards of rural life and making it fuller and richer—before the country and ensuring that the energies of the entire administrative machinery of the States and the best non-official leadership are directed to plans for its realisation that we can awaken mass enthusiasm and enlist the active interest and support of the millions of families living in the countryside in the immense task of bettering their own condition.”

2. This analysis led the Committee to propose the establishment of a national extension organisation for intensive rural work which could reach every farmer and assist in the co-ordinated development of rural life as a whole. The detailed proposals of the Committee on the organisation of the extension network at various levels have been described earlier. The programme envisaged by the Committee, for which the necessary provision has been made in the Plan, is that the Central Government should assist State Governments in establishing extension organisations so as to bring their entire area under extensive development within a period of about ten years. During the period of the Plan, about 120,000 villages are to be brought within the operations of the extension, that is, nearly one-fourth of the rural population. The Central and the various State Governments are expected in the near future to frame detailed programmes for re-organising the existing extension services, arranging for further recruitment and preparing training programmes.

In drawing up these programmes the Central and State Governments will have to examine the necessity for providing the basic training in agriculture and animal husbandry to the village level workers and the various supervisory subject matter specialists. Where existing facilities are inadequate, steps will have to be taken to augment them with a view to ensuring an adequate supply of extension workers for each major linguistic region. There is little doubt that the implementation of these proposals can give a new and powerful momentum to all rural work and, in particular, to the programme for increased agricultural production.

3. The organisation of extension services with the object of securing increased production and raising the standard of village life is a new undertaking. Extension is a continuous process designed to make the rural people aware of their problems, and indicating to them ways and means by which they can solve them. It thus involves not only education of the rural people in determining their problems and the methods of solving them, but also inspiring them towards positive action in doing so. It is, therefore, of the highest importance that for this task, personnel of the right type should be obtained who will take to their work with zeal and enthusiasm. The qualities required are not only the ability to acquire knowledge but also dedication to the task of serving the rural people and the development of a will to find solutions for their problems. People from village surroundings with experience of practical farming are likely to prove of special value as extension workers.

4. The training of extension workers requires the closest attention and must be related to the services that they will have to perform. They have to understand rural problems, the psychology of the farmer, and offer solutions to his various difficulties. They have to try and find out the felt needs of the people, and the solutions that they offer must be demonstrated by acting in close co-operation with the farmers. They should be able to discover leadership and stimulate it to action. Their success will depend on the extent to which they gain the confidence of the farmers. Their duties have thus to be educative and demonstrative. Their training will thus have many facets. Periods spent in gaining a thorough training will be a good investment. If the period of extension training is to be shortened, so as to be able to cover a larger area than may be otherwise possible, care should be taken to see that it is preceded by adequate opportunities for basic training in all aspects of rural development. Their conditions of service should also be such as are calculated to keep up their zeal and enthusiasm and ensure the continuous maintenance of high standards of performance. There should be considerable scope for promotion for men who start at the bottom. In order to develop the true extension approach much might be gained if all extension workers, whether graduates or field level workers, were to start at the field level and only those who proved their worth, received promotions to higher positions. A fair proportion of these positions should also be open to village workers who display the necessary qualities of leadership and ability. For this purpose, courses should be provided at different levels to enable the promising extension workers who start at the field level to reach positions of greater responsibility.

5. It is important to secure that the extension service retains its character of continued utility to the rural areas which they serve. This factor should, therefore, be particularly borne in mind in judging the work of officials who man this service. Local opinion on the extent to which an extension worker has made himself useful should be an important criterion in assessing his ability.

6. The confidence of the villager is gained with difficulty and lost easily. It is, therefore, of the essence of extension that the initial start is made with items whose usefulness to the cultivator in increasing agricultural production has been well established. It is only after sufficient confidence is gained that comparatively untried measures can be put forward, and even these should be held out as experiments until the people have found the answer for themselves.

7. The immediate effect of the first impact of an extension organisation is to increase the demands of the cultivator for credit, supplies and implements. The satisfaction of these demands is a necessary consequence of extension activities and they will succeed to the extent this responsibility is handled efficiently. Extension activities will be adversely affected if arrangements cannot be made for supplying the needs which they generate.

8. Finally, it may be pointed out that extension workers have to be supported effectively by research workers to whom they can bring their problems and whose results they carry to the people. Special arrangements are, therefore, needed to ensure the closest co-operation between extension and research.

CHAPTER XVI

FINANCE FOR AGRICULTURE

AGRICULTURAL PRODUCTION in this country depends upon millions of small farmers. It is the intensity of their effort and the efficiency of their technique that will help in raising yields per acre. Because of inadequate financial resources and absence of timely credit facilities at reasonable rates, many of the farmers, even though otherwise willing, are unable to go in for improved seeds and manures or to introduce better methods or techniques. Works of minor irrigation like wells owned by the cultivators either get into disuse or are not fully utilised for want of capital. The major object of the agricultural programme discussed earlier is to develop local resources of seeds, manures and irrigation and to provide other accessories of production. To utilise man-power and cattle resources more fully than is done at present, these aids to better and more intensive farming are essential. It is, therefore, of the utmost importance that the financial requirements of the producers for these purposes should be adequately met. The achievement of targets in the agricultural sector which covers production of food and essential raw material like cotton, jute and oilseeds, ought not to be allowed to suffer for want of adequate credit facilities. Provision of sufficient and timely credit at fair rates of interest has, therefore, to be considered as an integral part of the Plan. Assistance rendered by way of credit has, however, to be related to specific items of productive work or of essential costs of cultivation. For providing these facilities all the existing agencies *e.g.* money lenders, commercial banks, co-operatives and the State have to be integrated and harnessed to a common purpose. Such a comprehensive approach is essential for ensuring the best use of all the available resources of the nation.

NATURE OF REQUIREMENTS AND AGENCIES OF AGRICULTURAL CREDIT

2. Finance required for production can be divided broadly into : (a) short-term (for periods up to 15 months) ; (b) medium-term (from 15 months up to 5 years) and (c) long-term (above 5 years). Short-term loans are required for purchasing seeds, manures and fertilizers or for meeting labour charges, etc. These are expected to be repaid after the harvest. Medium-term loans are granted for purposes such as sinking of wells, purchase of bullocks, pumping plants and other improved implements, etc. Loans repayable over a longer period (*i.e.* above 5 years) are classified as long-term loans. These are utilised for payment of old debts, purchase of the heavier machines, making permanent improvements and increasing the size of the holding. A quantitative assessment of the finance required under these three categories is extremely difficult as adequate data for the purpose are not available. It is hoped that the rural credit survey undertaken by the Reserve Bank will provide more reliable estimates on the basis of which policy can be formulated. It is, however, clear that there is a wide gap between funds at present available on reasonable terms and the requirements of the cultivators.

3. The following agencies provide finance to the cultivators :—

- (1) Private agencies : (a) money lenders and landlords ; (b) commercial banks.
- (2) Public or semi-public agencies : (a) the State ; (b) co-operative societies.

Until recently, at any rate, the money lenders and the landlords were the principal sources of rural credit. It is generally believed that the recent debt relief legislation, the system of licensing money lenders and restrictions on the use and transfer of land as security have led to a considerable decline in their operations. The abolition of all privileged tenures and the impending reforms both in zamindari and ryotwari areas have discouraged investment by the landlords and larger cultivators. No estimates are available regarding the extent to which the money lenders and landlords have been affected by these considerations or of the extent of the role that they now play as providers of credit. The findings of the rural credit survey may throw more light on this important aspect of the matter and provide the basis for further thought and action. In the meantime, however, it is necessary to build up and expand the system of Government or co-operative credit so that the implementation of the Plan may proceed according to schedule.

STATE LOANS

4. As the finance provided from private sources was not adequate, the assistance rendered by the State in the form of taccavi loans had to be increased considerably during the last few years. The amount of taccavi loans sanctioned in 1949-50 was about Rs. 15 crores as against Rs. 1 crore in 1938-39. The State which formerly gave loans mostly for relieving distress or meeting the needs of a few indigent cultivators has now assumed increased responsibility for development finance especially as a result of the Grow More Food campaign. It is a matter of common complaint that the actual disbursement of these loans involves considerable delay and that the procedure connected with it causes considerable inconvenience to the cultivators. Our proposals regarding appropriate use of taccavi loans are discussed at a later stage in this chapter.

LOANS BY CO-OPERATIVE SOCIETIES

5. Besides State loans, a significant share of the finance for agriculture is provided by co-operative societies. There were 1,42,394 agricultural societies which advanced Rs. 28.53 crores in 1949-50 as against Rs. 6.75 crores advanced by 1,05,301 agricultural societies in the year 1938-39. Nearly two thirds of the total loans made by agricultural credit societies were granted in the two States of Bombay and Madras while 22 per cent of the funds were utilised by the societies in U. P., Madhya Pradesh and the Punjab. The credit movement in other areas has yet to be developed. Long-term loans extending up to a period of 20 years are provided by the 283 Land Mortgage Banks which advanced a sum of Rs. 1 crore during the year 1949-50. A major part of the long term loans was taken up again by Madras and Bombay where the movement has progressed fairly well. Punjab and West Bengal have not yet recovered from the unsettling effects of partition. In many of the Part 'C' and the newly integrated Part 'B' States, co-operative structure at the Apex and district levels has yet to be

created. Reorganisation and adjustment are also necessary in other areas. The progress and achievements of the movement in Bombay, Madras and the other co-operatively advanced States prove that co-operatives are the most effective agency for providing finance for agricultural purposes. A co-operative society organised by the people for their economic and social welfare places proper emphasis on the character of a member without losing sight of his material security. Compared to State agency a co-operative can exercise better supervision and it can ensure utilisation of loans for productive purposes more effectively. Recovery of loans is also facilitated as, besides coercive action, public opinion is also brought to bear against wilful defaulters. Co-operatives are also in a better position to mobilise local savings. It would, therefore, be advantageous to distribute even the State loans for development purposes through the co-operative societies. We recommend this policy.

6. As the major portion of the funds that they advance are derived by way of shares, deposits or loans, co-operative societies like other credit agencies have to operate on recognised banking principles. To avoid a serious risk of losses they have to deal generally with credit-worthy farmers. In addition to these, there are a large number of potentially credit-worthy cultivators in the rural areas who are just on the margin. Facilities granted to them either in regard to the terms of repayment or the rates of interest would go a long way to improve their productive capacity. It is considered desirable that the co-operatives should handle the credit business of this class also, as a separate agency for them would not only be expensive but would also lead to an undesirable duplication because in practice, it is difficult to distinguish between the credit-worthy and potentially credit-worthy people. Dealing with the latter class, however, involves more risk than that normally covered by the societies. To the extent that the co-operatives incur losses on account of the additional risk they may have to be compensated. The same procedure can be adopted for providing finance in less developed areas. The uneconomic cultivators should not be denied the benefits of the movement. In fact, it is difficult to maintain a distinction between economic and uneconomic cultivators as in the strict economic sense, most of the Indian farmers would be classified only as potentially credit-worthy or uneconomic cultivators. Many of them receive and repay loans from the societies, and will have to continue to do so. In their case character will be a very important factor in determining their eligibility for loans and the State will have to share a major part of the risk involved in this work.

7. To take up the functions visualised above the co-operative credit structure has to be strengthened at various levels in each State. The manner in which this can be brought about depends upon the conditions prevalent as well as the needs of the State. The Co-operative Planning Committee (1946) recommended that 50 per cent of the villages and 30 per cent of the rural population should be brought in the ambit of primary societies within ten years. The programme for a national extension service discussed earlier also contemplates organisation of multi-purpose societies in every village or a group thereof and efforts should be made to reach by 1955-56 the target set by the Co-operative Planning Committee. However, a slower rate of progress would be preferable to hasty expansion.

8. The success of the programme outlined above as well as the management of the co-operatives largely depend upon personnel. The absence of adequate trained staff is at present a serious limiting factor in the growth of the movement. The necessity of proper training for all grades of administrative, managerial and field staff in the Co-operative Department and co-operative institutions is being increasingly realised. The Reserve Bank has recently organised a special course of training for higher and intermediate personnel at the Co-operative College at Poona, which is conducted by the Bombay Provincial Co-operative Institute. A single institution, however, will not meet the needs of the country and similar facilities should be provided in other areas. We consider that there is scope for starting at least three more regional colleges almost immediately. Training for the subordinate personnel has also to be arranged simultaneously. We accord a high priority to the training programme and we have provided a sum of Rs. 10 lakhs in the Plan to subsidise a part of the expenditure. If the expenditure is to be put to good use, co-operative departments and institutions must increasingly appreciate the importance of employing trained staff and of deputing their employees for training.

9. Reorganisation and expansion of the movement in this manner for effectively carrying out the production programme will call for large scale investment. The co-operatives will have to initiate a drive for tapping local resources and for inculcating the habit of thrift in the local people. As the response to the savings campaign is, however, likely to be slow, finding adequate finance for the legitimate needs of their members may well prove to be beyond the resources of the co-operatives. Though ultimately the societies will have to build up adequate funds of their own, in the first instance they will need considerable financial and technical assistance from the Reserve Bank. The Bank has already taken a long step in this direction. Under the scheme of concessional finance it provides accommodation to the State Co-operative Banks for seasonal agricultural operations and marketing of crops at $1\frac{1}{2}$ per cent (*i.e.* 2 per cent below the current Bank rate). The period of re-payment has been extended by an amendment of the Reserve Bank of India Act from nine months to a maximum of 15 months. Several other facilities are also now offered by the Reserve Bank by liberalisation of the procedure for grant of advances.

10. As a result of this liberal attitude of the Reserve Bank its advances to the Apex Co-operative Banks have increased from Rs. 1.5 lakhs in 1946-47 to Rs. 12.51 crores in 1951-52. At present these facilities have been availed of mostly by the developed Apex banks of two States, *viz.*, Madras and Bombay. The Reserve Bank is taking an active interest in re-organising the co-operative movement in all States, especially the undeveloped States, on a sound footing. It has completed a study of the movement in practically all the States. In the light of these studies the Reserve Bank should be in a position to suggest measures of improvement for adoption by the States concerned.

11. The Bank provides short term accommodation to the co-operative societies through the State Apex institutions which, in turn, make it available to the district banks. The Apex Banks exist in the Part 'A' and a few important Part 'B' States, but some of them are not yet fully equipped to take up the increased responsibilities involved in borrowing from the Reserve

Bank. In many of the Part 'B' and 'C' States the Apex agencies have still to be created. The Reserve Bank has devoted attention to this task as well. The problems involved in expanding the movement are : (a) Securing trained personnel, and (b) finding adequate capital. As regards the capital it is likely that the funds necessary for organising or strengthening the Apex Banks may not be forthcoming in adequate measure from the local people or co-operative societies. State Governments which have an interest in creating these institutions and fostering their growth should subscribe a part of their capital and should be represented on their boards of management. The Apex agencies established in this manner would have greater stability and would give better results, even though such participation by the State would be a departure from the pattern hitherto favoured by most co-operators. While this effort to overcome the shortage of finance is underway, the State Governments may, if necessary, guarantee re-payment of the amount advanced by the Reserve Bank to the Apex Bank. This practice has already been adopted in a few cases. This must, however, be a temporary expedient and the movement should be able in the near future to secure its requirements on the basis of its own resources and the credit-worthiness of its constituents.

12. The essential characteristics of short term finance should be cheapness, elasticity and promptness. The concessional rate at which the Reserve Bank grants loans helps to reduce the interest rates charged to members. The characteristics of promptness and elasticity have remained comparatively neglected as the time lag and the rigidity of procedure associated with the whole mechanism of co-operative credit detract from the usefulness of the loans.

13. As the measures indicated above succeed in placing the credit structure in the States on a sound footing, the Reserve Bank and the Government should be able to provide even larger assistance. We are in agreement with the Grow More Food Enquiry Committee that in the next four years the advances to the cultivators through the institutional agencies should be steadily increased so as to reach the limit of at least Rs. 100 crores per annum by the fourth year. For achieving this and the other targets outlined later, it is necessary that a detailed plan of agricultural finance and co-operative development should be worked out by every State in consultation with the leaders of the movement, the Reserve Bank and the Central Government. The State plan will have to be broken down by districts keeping in view the main objective of the Plan in regard to its production targets and the relative priorities of its several parts.

MEDIUM AND LONG TERM LOANS

14. While short term loans meet the immediate and pressing needs of cultivation, medium term loans enable the farmer to raise the standard of his tillage and to bring about an improvement in yields. Much greater emphasis, has, therefore, to be placed on medium term loans than has been done hitherto and adequate accommodation should be provided for them. Precise estimates of the amount of such loans advanced by co-operative societies are not available. It is, however, known that the bulk of their advances are repayable soon after the harvest. This pre-occupation of the societies with short term loans is due firstly to their greater urgency and secondly to the very limited availability of funds (by way of long term deposits, etc.)

which they can safely invest for a medium term, say upto five years. The comparative inability of the co-operatives to meet this demand of the cultivator deters many a credit-worthy person from seeking even short term loans as in this process he gets indebted to more than one creditor. The co-operatives will not, therefore, be really effective agencies for credit unless they are in a position to grant these so called medium term loans which are essential to large production. Medium term loans of the societies do not qualify at present for assistance from the Reserve Bank. Many leading co-operators feel that the Bank ought to be empowered to make medium term advance as well. We understand that the proposal has been accepted by the Reserve Bank, which has agreed to make such advances upto a limit of Rs. 5 crores. To enable the Bank to take up this work, amendment of the Reserve Bank Act is necessary. A Bill incorporating these and other changes has been placed before Parliament.

15. Medium term finance upto Rs. 5 crores provided by the Reserve Bank under the proposed arrangement will help the co-operatives in building up their business on a sounder and a more productive footing. Larger assistance from the Reserve Bank for short term loans will also release some of the medium term funds of the movement where they are at present utilised for crop loans. To the extent that this occurs, the amount available for agricultural improvement will increase. However, in view of the fact that there is great demand as well as scope for productive investment in this sphere and also in view of the fact that the co-operative structure is being created and extended in areas in which co-operation has so far been less developed, it is to be expected that the sum of Rs. 5 crores to which the Reserve Bank has limited medium term finance will prove inadequate. It is essential that this limit should not be allowed to hamper the normal pace of production. We, therefore, recommend that a provision of rupees five crores spread over the next three years should be made in the Plan to supplement the resources of co-operative banks or other credit agencies created as an interim arrangement. These resources will, of course, include the intermediate finance which the Reserve Bank will be able to supply after its statute has been amended. Taking into account this additional provision, the accommodation likely to be available from the Reserve Bank and the funds that may be found within the movement, we consider that the target for medium term finance, Government and co-operative, at the end of the present Plan might be placed at Rs. 25 crores per annum.

16. As regards long term loans, the responsibility for financing improvements of a long term character, which benefit the community or a group of villages, will increasingly devolve on the State and the need for individual loans may diminish to some extent. However, this can be only a gradual process and assistance to individuals or a group for schemes of a permanent nature will continue to be an important item of production programmes. Consolidation of holdings and other schemes for improving the productivity of agriculture by increasing the size of the unit of cultivation are bound to widen the scope for long term loans. It is, therefore, necessary to have an organization which will assess these requirements and be in a position to satisfy them. This function can be best discharged by the land mortgage banks which possess long term funds raised by shares, debentures and fixed deposits. These banks exist in only a few States, *e.g.* Madras, Bombay, Mysore and Madhya Pradesh. The two main difficulties responsible for the slow progress of land mortgage banks are the lack of trained personnel

and the inability (legal) of the borrower to offer land as a security. As a result of recommendations made in this report elsewhere, these difficulties will soon be surmounted and we trust that as a part of the State Plan suggested in paragraph 12 of this chapter a long term agency will be created in more States. However, we do not deem it essential to have a separate land mortgage bank either at the State or district level in every case. Considering that the borrower and the security that he has to offer are generally the same for various types of loans, it has yet to be established that a separate agency for long term credit is invariably preferable to a single agency for different types of credit.

17. A major part of the advances made hitherto by the land mortgage banks are for repayment of old debts. The funds obtained either from the State or the community need in future to be utilised for purposes which will step up production and thus create a surplus of savings out of which the old debts may be discharged. The land mortgage banks should hence-forward lay greater emphasis on this developmental aspect and should give preference to applicants who want to increase their resources for enhanced production.

18. Another difficulty encountered by these Banks relates to finance which is often raised by floating debentures. Recently, some of the Central Land Mortgage Banks have found it somewhat difficult to raise long-term funds at sufficiently cheap rates of interest in spite of the fact that their debentures were guaranteed by the State Governments concerned and that the Reserve Bank, in accordance with its recent practice, subscribed 20% of the value in practically all these cases. There is therefore some apprehension that land mortgage banks, as a structure for long term credit, may languish for want of funds. This would hardly be in consonance with the objectives of the Plan. We have, therefore, made a provision of Rs. 5 crores spread over the next three years to supplement the long-term resources of the co-operative movement. We consider that the target for long term finance, Government and co-operative together should be Rs. five crores per annum at the end of the present Plan.

19. In regard to the principles which ought to govern the actual disbursement of the amount of Rs. 5 crores each which we have recommended to supplement the medium-term and long-term resources of the co-operative agricultural credit system, the following recommendations are made :—

- (i) The loans made out of these amounts should in all cases be linked to the programme of increased agricultural production, and should therefore be subject to the same priorities as that programme.
- (ii) Without prejudice to the above subject, the loans should be so distributed, with reference to regions and to classes of agriculturists, as to reach, by preference, areas and classes not served at present by the co-operative credit system.
- (iii) In planning the distribution of credit among such areas and classes, forms of organization should, if possible, be devised (*e.g.* borrowers' groups in villages) which can be readily developed into, or eventually fitted in with, the co-operative type of organisation.

- (iv) Where credit is disbursed in an area already served by the co-operative organization, the agency of that organization should be utilised as far as possible.
- (v) The contribution to long-term agricultural finance may, among other things, take the form of Government purchasing part of the debentures issued by land mortgage banks.
- (vi) In regard to the implementation of these recommendations, a detailed plan should be chalked out by the Government of India in consultation with the Reserve Bank and other organisations concerned.

20. Finally, in putting forward the proposals outlined in this chapter we envisage them as helping in the realisation of the targets in the Plan and as a part of and a first step to a comprehensive and integrated policy of agricultural credit to be evolved as early as possible on the basis of the factual material which is expected to be furnished by the rural credit survey. At this stage we would only suggest that in the wider solution of the problem the integration of financial agencies would have to extend to all organisations—co-operative, commercial and other which act as repositories and suppliers of credit.

The history of agricultural development in all advanced countries shows that such an integrated system of credit laid the foundation for agricultural development and prosperity. Whether there should be a single agency dispensing all types of credit, or a separate agency for long term or for long and medium term, what form this agency should take at the State level and whether the State agencies need to be integrated in a Central Agency at the All-India level, and what part the Agricultural Credit Department of the Reserve Bank should play in this organisation, are matters which will have to be considered in the context of the wider issues referred to above.

CHAPTER XVII

AGRICULTURAL MARKETING

THE PROBLEMS of agricultural finance discussed in the previous chapter relate to the pre-harvest requirements of the cultivators. The disposal of the produce after the harvest and the return obtained, therefore, also have a significant effect on production and on the welfare of the cultivator. Production in agriculture being seasonal, the crop is harvested during a short period and consumed gradually. While commodities like cotton and groundnut require large storage space which the average cultivator lacks, fruits, vegetables and sugarcane are of a perishable nature. The farmer has, therefore, to dispose of his surplus immediately either at the village or at the *mandi*. In the absence of staying power the large number of small farmers compete with each other and the markets witness conditions of occasional glut and scarcity. A major part of the commercial crops like cotton, jute, sugarcane and oilseeds has to be marketed immediately as the farmers are in need of cash for meeting their dues and other expenses. As regards foodgrains the marketable surplus varies by crops and regions but may be placed at about 20 to 30 per cent under normal conditions. The total quantity and value of the marketed produce, even in a predominantly subsistence economy as in India is considerable.

2. Sale of agricultural produce involves a number of functions such as assembling, storing, grading, standardising, transporting and financing the produce and negotiating sale. Some of these operations may be performed by the farmer, but storage and sale of a commodity and finding finance for purchase, call for specialised knowledge and adequate resources which the individual cultivator does not possess. Those who render these services, therefore, perform a useful function for which a reasonable return is due.

3. The village money lender or the *mandi arhatiya* advances loans to farmers for securing production requirements like seeds, and manures and for meeting other needs. These debts some times carry an understanding or an obligation to sell the produce to or through the lender or his nominee. At the time of sale the position of advantage occupied by the village banker gets reflected either in a lower price or unfair weights or delayed settlement. If the sale takes place in the *mandi* or the market through the brokers or *arhatiyas* the farmer pays not only for the services rendered by the middlemen but is also subjected to other unwarranted deductions.

4. To remove the disabilities of the farmers in the *mandi*, regulated markets have been established in the States of Bombay, Madras, Punjab, Hyderabad, Mysore, Pepsu and Madhya Pradesh. Unauthorised deductions are prohibited and the charges of brokers and weighmen regulated. In some of these places the system of open auction or sales has been introduced. These improvements have benefited the cultivator to a certain extent. Regulated markets, however, do not exist in the States of Uttar Pradesh, West Bengal, Bihar, Orissa, etc. Some

of the States which have adopted the Agricultural Produce Markets Acts have a large number of markets which still continue to be unregulated. It is necessary to extend the operation of the Act so as to cover all the important markets in each State by 1955-56, as this is the first step in improving marketing facilities.

5. The management of regulated markets vests in committees on which growers are also represented. Their voice is, however, seldom effective. Many of the marketing committees are not yet fully conscious of their responsibility of utilising their funds for developing marketing facilities. The Madhya Pradesh Government have, therefore, amended the Cotton and Agricultural Produce Markets Act with a view to entrusting the management of regulated markets to the Co-operative Societies and the Cotton Market at Amravati has been handed over to the local marketing co-operative.

PROGRESS OF CO-OPERATIVE MARKETING

6. The benefits of a regulated market which attempts only to improve the existing practices are limited ; without changing the marketing structure the number of middlemen and costs cannot be reduced. Efforts in this direction have been made in some States by organising co-operative marketing. For example, 1,600 cane co-operative unions and other primary societies have been organised in Uttar Pradesh in the last 10 years. They handle 85 to 90 per cent of the total cane supplied to sugar factories. The average value (3 years ending 1951-52) of about 50 lakhs tons of cane annually sold by the societies amounted to more than Rs. 25 crores. This has been achieved under the Sugar Factories Control Act which requires every member of the society in the zone to deliver a specified quantity of cane through the co-operative society for which minimum prices are paid by the factory. The co-operatives are paid a commission of about Rs. 1/4 per ton for their services by the sugar factories. This is taken into account while calculating the sale price of sugar. Besides arranging the sale, these co-operatives are making an attempt to link up credit with marketing. They supply seeds, manures, fertilizers and other requirements. The unions also carry on rural welfare activities.

7. Co-operative marketing of cotton has been attempted in Bombay where 84 cotton sale societies functioned in 1948-49. While the societies in Karnatak arrange the sales of the produce of their members in individual lots, the Gujarat cotton growers pool cotton of a similar variety for purposes of sale. The co-operatives own 11 ginning and pressing factories in the State. The producer-cum-consumer societies in Madras which have been converted into marketing societies and a few others in other States are also making efforts in this direction. Some of them have taken up procurement work for the Government. Provincial marketing societies which have been established in 9 States to assist the primary units registered only a small volume of business which amounted to Rs. 1.15 crores in 1949-50.

8. The progress of marketing societies, in spite of immense scope, has so far been slow. The entry of a co-operative even as an agent is not generally favoured by the trade. For instance, it refused to buy cotton offered by the Cotton Sale Society in Karnatak and boycotted its

sales. The buyers also make payment after a time lag and the co-operatives acting as agents are required either to raise a large amount of finance to meet their commitments or to keep the amounts outstanding. The U.P. sugar factories, for example, were in arrears to the extent of about rupees two crores, to the societies by the end of the year 1950. Some of the co-operatives had to engage contractors for finding finance and making payments. The performance of the contractors was unsatisfactory and their charges were heavy. To overcome such difficulties the Gujarat Cotton Sales Society established a ginning factory. This facilitated the sales and the ginning charges were reduced by 50 per cent. The Society however, did not own the pressing factory and utilized a plant belonging to the traders. After sometime the press owners raised their charges by more than 75% and declined to undertake the pressing work on behalf of the Society. The society was, therefore, compelled to erect its own press. The cane growers of Ahmednagar District in Bombay State who had suffered for the last 30 years from violent fluctuations in prices of gur they produced, have recently set up a Co-operative Sugar Mill which has not only ensured them better prices and timely payment but has also helped them in improving the efficiency of production through the supply of manures, fertilizers and seeds. The society tries to work with each farmer on his problems and provides long term credit for development. The loyalty and the support of the members, the enlightened leadership, financial aid in the shape of share capital—rupees six lakhs from the Bombay Government and a loan of Rs. 20 lakhs from the Industrial Finance Corporation are some of the important factors which have led to the success of the scheme.

9. It would thus appear that even after the linking of credit with marketing, co-operatives, which act only as commission agents for sale (as in Uttar Pradesh) are not effective and that ownership and management of processing facilities on a co-operative basis are essential for protecting the interests of the growers and strengthening the economy. The benefits of efficiency and economy in the processing activities are considerable, and if they are transmitted to cultivators, there will be an incentive for increasing production. A co-operative which functions in this manner can also assist in crop planning by introducing improved varieties of seeds, by giving the necessary technical advice to cultivators and by financial help wherever necessary.

10. There are, however, some commodities which are marketed without elaborate processing. In such cases the marketing co-operative will have to establish direct dealings with the consumer co-operatives. In Canada, the Grain Growers' Co-operative Company in Winnipeg having been boycotted by the Canadian traders, had to negotiate sales of wheat with the Scottish Co-operative Whole-sale. In this country there exists a considerable volume of inter and intra State trade in wheat, pulses, fruits, vegetables, etc. By contacting its counter-parts in other States the provincial marketing association should work out an arrangement for imports and exports. Similar arrangements within the State could also be made.

11. Some of the marketing societies appear to have been organised without adequate share capital. The Madras Provincial Marketing Society, for instance, has a share capital of about Rs. 50,000 while Orissa and West Bengal Apex Marketing Societies are functioning with a share

capital of about Rs. 13,000 and Rs. 5,000 respectively. The credit limit assessed by and assistance available from the State Apex credit agency and the Reserve Bank for financing marketing operations depend upon the capital structure and owned resources of the society and the volume of its business is largely regulated thereby. It is, therefore, necessary that marketing associations especially those which are meant to be apex agencies should obtain sufficient capital from their constituents.

12. Marketing requires technical skill and specialised knowledge. Associations operating in a group of villages or dealing with a commodity do not have the volume or turnover to warrant employment of trained or qualified personnel. The area of operation of a marketing society should, therefore, be fairly large, say a Tehsil. Further, separate societies for individual commodities should be restricted only to such staples of trade as have a specialized wholesale market.

STORAGE AND WAREHOUSING

13. Another difficulty that the societies encounter relates to storage facilities. Most of the surplus produce in an area is assembled and sold at the *mandi* or market which is generally at the rail or motor head and possesses road transport and banking facilities. On the strength of the goods pledged the banks finance the marketing operations. Release of goods and their despatch either on consignment or sale can be arranged more quickly from the godowns at the *mandi* than from those located in the rural areas. It would, therefore, be an advantage to develop storage facilities at *mandi* centres. Some godown space—temporary, semi-temporary or permanent—is available in every *mandi*. This accommodation is often unsatisfactory as it fails to provide adequate protection to goods from damage and deterioration by moisture, rodents, insects, pests, etc. Moreover, even for getting such space, fairly high rent has to be paid. It would, therefore, be better if the co-operatives plan to have their own storage facilities. Some State Governments, particularly Madras, Bombay, and Orissa are alive to this problem and are rendering assistance by providing loans and subsidies for the construction of godowns. Other States, we suggest, may follow this practice.

14. Several committees and commissions including the Royal Commission on Agriculture, the Central Banking Enquiry Committee, the Marketing Sub-Committee, the Agricultural Finance Sub-Committee, the Co-operative Planning Committee and the Rural Banking Enquiry Committee have emphasised the need to promote warehousing in the country and have also made various suggestions in this connection. In the absence of warehouse receipts which could serve as collateral for the promissory notes of the borrowing banks, it has not been possible for the Reserve Bank to extend assistance to the co-operative and scheduled banks under section 17 of the Reserve Bank Act for financing marketing operations. The Reserve Bank, therefore, suggested establishment of licensed warehouses. The States of Bombay, Madras, Madhya Pradesh, Mysore, Hyderabad and Travancore-Cochin have already enacted the necessary legislation. We recommend that similar action should be taken by other State Governments as well. Even though the Warehousing Act has been passed in some States more than four years ago, licensed warehouses have not been established

so far. This is largely due to the fact that the law, being an enabling piece of legislation, leaves it to the trade, private investors, limited companies or the co-operatives to set up the warehouses. The investors generally hesitate to take up a new venture in which they have little experience. Further, the law provides not only for regulation and inspection of the warehouses but also for fixing the charges at a reasonable level. Under the present conditions when the money market is tight and there are other more remunerative fields for investment it is doubtful if private capital would be attracted, particularly in producing areas. Progress will, therefore, depend mostly on the initiative of the co-operatives and their ability to secure the required long term capital. We therefore suggest that the State Governments and the Reserve Bank should assist warehousing development by measures such as provision of loans, etc. to organisations which are willing to undertake this work.

FUTURE PATTERN OF DEVELOPMENT

15. Co-operatives will be successful to the extent that they render efficient service to the growers at the minimum cost. This in turn depends upon their ability to undertake processing activities, command warehousing accommodation, and obtain sufficient financial resources and, above all, honest, capable and efficient management. Though some States have fostered the growth of marketing societies, a policy for their development has yet to be laid down or followed for the country as a whole. Co-operative marketing linked with production, finance and co-operative ownership of processing industries will be a useful instrument in increasing production, cutting costs and introducing a system of crop planning. Favourable conditions for their growth have, therefore, to be created without loss of time.

16. In this context we suggest that processing plants established hereafter should be owned and managed by co-operative societies, and licences and other forms of support given to them by the States. Where such societies do not exist active and timely steps should be taken to organise and to equip them. As regards co-operative management and ownership of the existing facilities the progress will depend upon the speed with which the necessary organisation can be created and personnel trained. Where the movement has developed well in other fields such as the States of Madras and Bombay—marketing societies may develop more rapidly as to them would be available the long standing and valuable experience of co-operative workers. Co-operatives in other States would also benefit thereby as they would be able to build societies after taking into account the result obtained in these States.

17. The technical, marketing, financial and administrative problems involved in these operations need expert study, guidance and supervision particularly in the initial stages. As every State may not be in a position to provide the experts and in some cases they may not have full-time work, it would be an advantage to have a standing committee of four experts on processing and marketing at the Centre. The Committee should assist the State Governments

and the co-operatives in drawing up detailed schemes after a careful examination. It would be their responsibility to review the progress of work of every unit in the State from time to time and make a comparative study of the factors which hinder the work. In the past many a marketing co-operative foundered because the local manager and the Board could not foresee or tackle a problem on their own. While failures in private trade or industry often go unnoticed, mistakes or shortcomings of a co-operative attract a good deal of public attention and criticism because of its democratic character and economic and social significance. Hence the need for and importance of expert guidance. As regards long term finance required by the societies for purchasing machinery and other equipment we consider that it should be made available by the State and Central Industrial Finance Corporations.

18. As the co-operatives gain a surer foothold in the commodity markets it should be possible to bring the management of regulated markets more and more under co-operative direction. Immediately, co-operatives should be given adequate representation on the managing committees of regulated markets. As the positive services made available to growers by these co-operatively directed market committees become more evident, the committees may be empowered to make a small charge on the produce handled by them for a further expansion of these services. In this manner it would be possible for each market to build up funds of its own. On their strength the co-operatives could obtain accommodation from the banks for financing their operations.

GRADING

19. The introduction of proper grades and standards is another matter in regard to which the State can usefully assist. Grading of farmer's produce before sale on the basis of well defined grades in a regulated market will help in the proper valuation of his produce which will enable him to claim a price commensurate with the quality offered, thus providing an incentive to improve its quality. Grade standards are also necessary as a basis for the issue of negotiable receipts by warehouses and economical development of public storage facilities. The poor quality of the agricultural produce has been an important handicap in export markets. Shipments of cashew-nuts, black pepper, turmeric, wool, etc., fetch reduced prices and get condemned abroad as they contain foreign matter and are not of uniform quality. On the other hand, the introduction of grading on the basis of Agmark quality standards has yielded satisfactory results in respect of tobacco and sann hemp. To remove the handicaps experienced by other commodities and promote export trade, it is proposed to undertake grading of wool, bristles, lac, sheep and goat skins, cashew-nuts, oilseeds, oils and kapok, the export value of which was of the order of Rs. 110 crores annually during the 3 years immediately after partition. These commodities would be brought under compulsory grading in successive stages. The total estimated expenditure on the scheme would be Rs. 86.47

lakhs which would be recovered from the levy of charges under Section 3(f) of the Agricultural Produce (Grading and Marking) Act of 1937. The following statement shows the programme :—

Year	Scope of Plan	Developmental Expenditure (Rs. lakhs)
1951-52	Grading of tobacco and sann hemp	5.06
1952-53	Grading of wool, bristles and goat hair and lac . .	11.41
1953-54	Grading of sheep and goat skins	14.38
1954-55	Grading of cashew-nuts, pepper, spices and lemongrass oil .	22.62
1955-56	Grading of kapok, myrobalans and other forest produce (rosin, turpentine, etc.), vegetable oilseeds and oils. . . .	33.00
	TOTAL .	86.47

It is estimated that as a result of grading the export value of these products would increase by about 10 per cent.

20. In the internal trade the question of grading food products, particularly, milk, ghee and oil, is very important in view of its bearing on the health of the nation. We have discussed the problems connected with the purity of milk elsewhere. Our remarks here are confined to the grading of ghee and oil. The grading of ghee started in the year 1939 and a peak figure of 3.4½ lakh maunds was reached in 1944 and then dropped down to 95,000 maunds; at present it is about 1.2 lakh maunds. Grading is voluntary and will develop to the extent that a market for graded products can be created. All departments of Government and other institutions, which buy ghee on a large scale, particularly hostels, hospitals, railway contractors, etc., should be required to purchase Agmark products. The graded ghee costs about Rs. 10/- per maund more than the ungraded product. The grading costs would get reduced by improving the efficiency of operation and increasing the volume of business. A little rise in price is warranted by the superior quality of the products. Grading of mustard oil, groundnut oil, and til oil has also been taken up by the Central Marketing Department and about 1.8 lakh maunds are being graded at present. The railways have decided to buy graded oil for the requirements of their personnel. In some areas experiments with compulsory grading of oil and ghee could be tried by prohibiting the movement of ungraded oil by rail and road.

Sufficient power does not exist under the Agricultural Produce (Grading and Marking) Act, 1937 to prevent misuse of Agmark labels. The Act is being amended to secure these powers.

Laying down specifications for grading agricultural commodities should always be done in consultation with all the interests concerned, the State Governments and the Indian Standards Institution. This is necessary to preserve uniformity in standards throughout India. There are certain products which, though absolutely pure, have regional standards different

from all-India standards. In such cases these regional standards should have the same validity as the Agmark standards and should be accepted by all State Governments. At present this is not so. Agmark standards should also be considered as satisfying the pure food laws of the local bodies.

WEIGHTS AND MEASURES

21. The importance of standardisation of weights and measures may also be stressed here as there is a bewildering variety thereof in the country. To introduce uniform system the Central Government enacted the Standards Weights Act in 1939 and commended it to the States. Bombay, Punjab, Bihar, Mysore and Hyderabad have enacted and are enforcing the necessary legislation. But in Madras, Madhya Pradesh, Uttar Pradesh and Orissa the Act though passed has not been fully implemented. We consider that every State should introduce and enforce the Standards Weights Act as this will benefit both the producer and the consumer.

CHAPTER XVIII

SOME PROBLEMS OF AGRICULTURAL DEVELOPMENT

IN THIS chapter we consider a number of problems of agricultural development most of which are linked to the question of agricultural research. Training and research are discussed in the concluding sections of the chapter; but most of the problems dealt with earlier, whether it be the supply of better seed and fertilisers, the protection of crops from pests, the improvement of agricultural implements, or the devising of better methods for conserving the moisture of the soil, depend for their solution on the successful application of scientific knowledge to the every day operations of the ordinary cultivator.

MINOR IRRIGATION AND RAINFALL

2. A timely and adequate supply of water is absolutely essential for securing the maximum output from the land. In India nearly four-fifths of the cultivated area is dependent on rainfall which is seldom adequate and timely throughout the whole country. Annual failure of crops in different regions of India is, therefore, a common feature of Indian Agriculture. The most effective way of increasing crop production in India is to provide through irrigation an additional source of water supply to cultivated land.

3. Irrigation is usually classified under two heads, major and minor. The area under major and minor irrigation works is 20·6 million and 26·4 million acres respectively. Another classification is based on the agency providing irrigation *i.e.* whether private or Government. While most of the canals are government owned, wells and tanks, etc. are largely owned by private parties. The area under private and canal irrigation has varied as follows during the last 25 years in two of the principal States for which comparable figures are available:—

State average for		(in million acres)			
		Irrigation by canal		Private	
		U. P.	Madras	U. P.	Madras
1920-25	. . .	2·15	3·80	5·18	5·07
1925-30	. . .	2·61	3·95	4·98	4·69
1930-35	. . .	3·15	3·88	5·00	4·77
1935-40	. . .	3·63	3·91	5·40	4·41
1940-45	. . .	3·95	4·24	5·25	4·76

It will be seen that there has been practically no increase in private irrigation while the area under canal irrigation has increased by 83·71 and 11·6 per cent in U. P. and Madras respectively.

4. The fact that during the last 25 years the area under private irrigation has remained more or less unchanged, indicates that future scope for individual investment in irrigation works is small; and this is likely to be still further diminished by reduction in the present size of holdings consequent on land reform legislation. Such works will in future have to be increasingly undertaken on a community basis with or without State assistance. We endorse, however, the recommendation of the G. M. F. Enquiry Committee that separate funds should be allotted for sinking of wells by small landholders.

5. Small and medium irrigation works have an important part to play in developing irrigation in the country. They have many obvious advantages. They provide a large amount of dispersed employment. They involve smaller outlay and can be executed in a comparatively shorter period. Being spread over the country, they confer wide-spread benefit, and it is, therefore, easier to mobilise public co-operation in their construction. In view of these advantages and their contribution to increase production, a special provision of Rs. 30 crores has been made in the Plan for minor irrigation schemes. We recommend that every State should carry out a systematic survey of the possibilities of undertaking such schemes, and formulate a programme of execution in an order of priority, so that their construction can be effected in a planned manner. An administrative arrangement under which a trained corps is available to execute such projects on condition that certain contributions in labour and cash are provided by the local people would stimulate local competition for their execution. Such an arrangement is being adopted for the Community Projects and should be extended as and when the State can put in the field a suitable organisation for the purpose.

6. The question of maintaining these works in a proper state of repair has assumed importance, because the traditional systems in vogue have fallen into disuse. While legislation has been passed for the abolition of Zamindari, alternative arrangements have not been made for the repair of tanks which were under the zamindars' management. Frequently the beneficiaries of these works do not pay any water rate or other dues, and repairs are postponed, as responsibility for recovery of their cost cannot be fixed. In view of the large area irrigated by these works and the capital invested in them, we consider that the responsibility for their maintenance and repair should be unambiguously fixed and that the beneficiaries should be required to pay water rate in proportion to the advantage derived by them. The management of these works should vest in the irrigation department which should be made responsible for their annual maintenance and repair and should utilise village panchayats or cooperatives where they exist, as agencies for carrying out these repairs.

7. Since so much of the cultivated area depends entirely on rainfall, problems of dry farming should receive much more attention than they do at present. By preventing field run off and surface evaporation the moisture of the soil can be conserved and crops successfully raised under dry conditions. Research on this important matter has been conducted at Sholapur and Bijapur in Bombay, and at Rohtak in the Punjab. The experiments indicate that fair crop yields can be assured in a bad year and increased yield obtained in a

normal year by following improved methods which include construction of bunds and embankments, production of soil mulch, proper weeding and hoeing and the use of drought resistant varieties of seed. There is scope for wider adoption of these practices by the cultivators. The difficulties experienced therein have to be studied by the extension staff and their solution found with the help of research.

8. The Meteorological Department has five Regional Forecasting Centres in India which issue weather bulletins daily for farmers. The bulletin is ready by noon, but it is broadcast by the All-India Radio in the Villagers' Programmes in the evening, so that the villagers can listen to it. The Director of Agricultural Meteorology receives check reports from government farms comparing the forecasts with the weather actually experienced. A periodical assessment of these returns shows that the forecasts have a very high degree of accuracy.

9. No steps have yet been taken to ascertain how these forecasts can be used to secure better timing of agricultural operations. The Agricultural Experimental Stations which verify the forecasts could be utilised for this purpose. This will involve some of them being equipped with radio sets to enable them to take full advantage of the forecasts. It is necessary that this should be done as it has yet to be established that the knowledge provided by weather forecasts can be utilised for the better timing of agricultural operations and so for obtaining increased production. It is only after this is established that the forecasts can be passed on to the cultivators and they can be advised to use them to guide their agricultural operations.

Simultaneously with this, each State might select an area where communications can be so arranged that it is possible for the weather forecast to reach the cultivator the same day that it is issued. Observations could then be made how this knowledge helps the farmer in timing his agricultural operations. Many States have community radio sets in blocks of villages and we suggest that a beginning should be made in any such area where this can be organised.

IMPROVED SEED—PRODUCTION AND SUPPLY

10. One of the most outstanding achievements of modern agriculture is the production of improved varieties of seed for different crops. The cultivator is generally well aware of the importance of using good seed. Good cultivators are known to preserve their own seed. Certain varieties of seed have spread by themselves without special departmental efforts; and if improved seed is not making such headway as it should, the cause must be sought in some defect in the seed or elsewhere than in the apathy of the cultivators.

11. The mechanism for the production and distribution of pure seed is generally the same in all the States. A variety is bred and nucleus seed is produced on government farms. It is then multiplied in two or three stages with two or three classes of cultivators, usually known as A, B & C. The seed from government farms is handed first for multiplication to 'A' class cultivators. The seed multiplied is then made over for further multiplication to 'B' class cultivators after which it is distributed. In some States, however, there is a third stage of multiplication. It is noticed that the larger the number of intermediate stages, the less

the purity of the seed available for distribution. Failure to rogue properly, mixture with other grains and bad storage are some of the causes of the loss of purity and viability.

12. The scope for securing increased production from the use of improved seed is very considerable. We are not satisfied with the progress achieved so far, and feel convinced that there is much room for improvement in the system of multiplication and distribution. Some States have adopted legislation making the use of improved seed obligatory. In the case of crops liable to cross-fertilisation, such a course is essential, but where soils differ considerably and require to be planted with different varieties of the same crop, compulsion would be possible only if pure seed of each variety is available. A strong public opinion has necessarily to be built up before legislation can be made effective.

13. In some States the collection and distribution of pure seed was handed over to co-operatives, but the results have not been altogether satisfactory. In the Punjab, where pure seed is collected along with other grains in the course of monopoly procurement, there have been complaints of seed deterioration. We consider that the multiplication and distribution of pure seed should be decentralised as far as possible, so that nucleus seed can be made to reach every single village or a group of villages. This will need a large number of seed farms operated by or under the close supervision of the Agricultural Department. Such farms, if large enough, can also be used for other experimental work. We recommend the location of one such farm in each block of a Community Project i.e. one for every group of about 100 villages. These farms can supply pure seed to the surrounding villages, and the duty of multiplying that seed and making it available for local distribution should be cast on holders of large farms.

14. Pedigree seed, issued for cultivation in a particular area, has to be renewed every four or five years to keep up its quality. This is the present experience of the Agricultural Departments, but scientific explanation for it is lacking. There is need to obtain accurate information as to what exactly happens under the cultivator's field conditions which leads to the deterioration of sound seed. Gradually the responsibility of the Agricultural Department for the supply of pure seed will devolve on registered seed supply agencies, and this information would be useful in arranging this transfer.

15. Experience has shown that pure seed of commercial crops, like sugarcane, groundnut, cotton, etc., spreads much faster than the seed of food crops. This may be partly due to the greater attention paid to these crops in the past, and to the work of specialised agencies created for their development. The supply of pure seed for food crops improved somewhat in the past few years, when considerable stress was laid on their propagation as part of the G.M.F. campaign. In spite of this, the progress has not been very great. It may be that there is special difficulty in maintaining the 'purity' of the seed of crops which are widely consumed as food. The question requires further examination.

16. The Agricultural Departments should guard against the tendency to issue new varieties of seed for adoption by cultivators without full and complete trials conclusively establishing their superiority over those in use. In such cases, carefully docketed information on the experience of various growers of the new variety should be available. Frequent changes of seed—particularly if it is not fully tried—may shake the confidence of the cultivators and add to the difficulties of extension workers.

17. Attention has often been drawn to the saving which can be effected by a reduction in seed-rate but no systematic attempt has been made in any compact area to introduce sowing with a low seed-rate. The practice of treating the seed with a suitable fungicide before sowing requires to be introduced. The advantages of this practice are not widely known and deserve to be demonstrated.

18. We recommend the appointment by the Indian Council of Agricultural Research of a Standing Committee of Plant Breeders and Extension Workers to review every year the technical and administrative aspects of the multiplication and spread of improved varieties of seed and to make recommendations in the light of the review.

MANURES AND FERTILISERS

19. Manures and fertilisers play the same part in relation to the soil as food in relation to the body. Just as a well-nourished body is capable of the maximum effort, a well nourished soil will have the best fertility.

20. The quality of the soil varies greatly in a country of the size of India. A systematic survey of the soils of India has not yet been carried out, though it is generally known that Indian soils are deficient in organic matter, nitrogen and phosphates. Soil samples have been analysed in different areas, but their correlation into a soil-survey for the whole country has not been undertaken. Field experiments have been conducted in various regions to determine the response of crops to various combinations of organic and inorganic manures, but in most cases crop responses and soil analysis have not been linked up. A very little work in connection with the effects of trace-elements in the soil has been done hitherto. It is now proposed to undertake a programme, designed to correlate soils, manurial trials and crop responses over the whole country. A beginning will be made with the Community Project areas and other selected areas in each State. A systematic study of the effect of trace elements in soils is also being made. Assistance under the T. C. A. has greatly facilitated this work.

21. Organic matter, nitrogen, phosphorus and potash are the chief constituents which must be supplied to the soil. Nitrogen is of the first importance in crop production. The soil has a mechanism by which it absorbs nitrogen from the atmosphere and makes it available to living beings in the form of grain and fodder ; men and cattle derive energy from the consumption of these and the nitrogen taken from the soil is returned to it in the form of organic manures like farmyard manure, green manure, oilcakes, composts of various kinds, bone-meal and various types of chemical fertilizers, thus completing the nitrogen cycle.

Next in importance is phosphate. Plants absorb phosphates from the soil which are returned to it through animal and human excreta and through decayed plants and their ashes and the bones of dead animals.

Indian soils, while deficient in nitrogen and phosphates, are generally rich in potash. Lack of potash does not, therefore, present a serious problem at present but it is one that should be watched.

22. Manures may be classified into two categories—(a) organic manures and (b) inorganic manures. Organic manures may further be sub-divided into (i) bulky organic manures; (ii) concentrated organic manures. Bulky organic manures include farmyard manure, compost manure, nightsoil and green manure, while concentrated manures are oil cakes, bonemeal, dried blood, horns and hoofs, etc. Tropical soils often lack humus. The addition of bulky organic manures like farmyard manure, which is a by-product in farming by bullocks, helps the soil by increasing its water holding capacity, improving soil aeration, and by changing the plant nutrients through slow decomposition into forms readily available to plants. There are other advantages in the use of organic manures namely (a) steadiness in yield over a period of time (b) benefit to the succeeding crops by their residual effects, and (c) ability to withstand unfavourable weather conditions.

23. On the basis of the 1951 livestock census the total production of fresh dung is estimated at 800 million tons ; however, all this valuable manure does not go back to the land. A large part of it—which may amount to nearly 50 per cent—is used as fuel by cultivators. The dung which is now burnt can be saved for agriculture if suitable supplies of fuel are made available. We have recommended in the chapter on Forests the creation of village plantations and popularising the use of coke.

The above estimates do not relate to cattle urine which is rich in nitrogen but mostly goes to waste. Conservation of cattle urine should be an item of extension work in all States and increasing attention should be paid to the conservation of this useful source of manure.

24. Human excreta and urine are very important sources of nitrogen, phosphorous and organic matter. Their maximum utilisation occurs in China and Japan but in those countries they are applied in a raw uncomposted form, and harmful bacteria find their way to the crop and affect the health of those who consume it. This is avoided in India, where such manure is almost invariably applied after proper composting.

25. In urban areas, where the night soil is removed by sweepers, it is usually composted with refuse, and the manure is sold to the cultivators. Most State Governments have passed legislation making it obligatory on Municipalities and Notified Area Committees to dispose of night soil in this way, and a steady improvement in the amount of urban compost is noticeable.

							Lakh tons
1946-47	.	.	.	.	.	.	2.89
1947-48	.	.	.	.	.	.	3.80
1948-49	.	.	.	.	.	.	5.17
1949-50	.	.	.	.	.	.	9.23
1950-51	.	.	.	.	.	.	10.63
1951-52	.	.	.	.	.	.	13.50

Out of about 3,000 towns where Municipalities and Notified Area Committees are functioning, composting is in progress in 1684 towns only, yielding annually about 17 lakh tons of compost. Provision has been made in the Plan for extension of composting to the remaining towns. At the end of the period of the Plan about 30 lakh tons of compost would be available.

26. The utilisation of urine, whether human or animal, for manure is of even greater importance than the utilisation of nightsoil or dung, as the former provides a much larger proportion of nitrogen. We have not yet developed any efficient and popular system or appliances for utilising urine as manure. Its collection is easier in towns with underground sewerage which have a scheme of sewage-utilisation. In other towns only the nightsoil is collected by municipal authorities. Urine collection is not practicable, unless community urinals have proper appliances for soaking and utilising the urine, and a suitable urinal is devised for family use where the urine can be collected and absorbed.

27. Preliminary work has been done on this subject at the Indian Agricultural Research Institute and the 'Agri-San' urinal is being evolved. In the Punjab, the 'utility' urinal is being recommended for collection and utilisation of urine. The installation of these urinals would help to conserve urine in areas without underground drainage. In order to introduce these urinals into the daily life of the people a beginning should be made with institutions like jails, hospitals, schools, boarding houses, cinema houses and other public places.

28. In the rural areas the nightsoil and urine are not generally being utilised as manure. Here it is necessary to distinguish between a mere return of urine or nightsoil to the soil and its utilisation as manure. When a field is utilised for defecation, as frequently happens in a village, there is a return to the soil but the manurial value of it is small as most of the valuable constituents are lost by exposure to the air and sun. It is necessary to devise a suitable latrine, which villagers can use and which will be sanitary, convenient, and fly-proof and can be shifted. The trench-type holds the field at present. It may be mentioned that the cost of construction and maintenance of these latrines with local materials, can be covered by the sale of the manure that will be made available. Public urinals should also be located at suitable places in the village area.

29. It has been recently found that cattle and human wastes yield fuel gas by appropriate fermentation without much loss of organic matter and of nitrogen compared to the ordinary composting process. If this process, which has successfully passed through laboratory and pilot plant stages, is developed, it will check the burning of dung as fuel and thus augment materially the supplies of organic manures.

30. The growing of leguminous crops and burying them under the soil is a well known method of soil building. The nodule bacteria fix the atmospheric nitrogen in the soil in a form readily available to plants and the turning under of the crop adds organic matter which is essential for keeping the soil in good heart. The value of green manuring has been recognised, but it has not become a common practice even in the area where adequate rainfall or ample irrigation facilities are available. The pressure of population in such areas is generally so great that the cultivator cannot afford to bury a crop which does not directly bring him any return.

On the other hand, larger land holders have been observed to practice green manuring on a reasonable scale. In the case of small cultivators, the introduction of leguminous catch crops, especially pulses, in the ordinary rotations preferably with phosphate manuring would do much to help increase the nitrogen contents of the soil. They will not only add to the food reserve of the country but would also be valuable as a rich source of proteins. They are important also from the point of view of animal nutrition to which they contribute indirectly in the form of hulls and straw. Where conditions are favourable the State should take steps to encourage growing of such crops by providing necessary facilities and inducements such as supply of seed and irrigation at the time of sowing, and by offering concessions such as remission of water rate or land revenue.

31. The principal oilcakes available in the country are ground-nut, sesamum, rape, linseed, cotton seed, castor, *mahua* and *neem*. They contain about 3 to 6 per cent nitrogen and 1 to 2 per cent phosphoric acid. Used as manure, they serve as carriers of available nitrogen and have shown consistently good results on a variety of crops. Most of the edible oilcakes are valued as cattle-feed, but lately some of them particularly ground-nut, are also being extensively used as manure. We consider this practice undesirable especially as there is a shortage of cattle-feed in the country. Non-edible oilcakes alone should be used directly as manure. Better results are obtained if chemical fertilisers are used in combination with these oilcakes.

32. Blood meals, horns, hoofs, and meat meal are the by-products of the slaughter houses which can be used for fertilising the soil. Fresh blood in its natural state contains 2.5 to 5 per cent of nitrogen while in the dried form it contains from 8 to 14 per cent of nitrogen depending largely upon the method of manufacture. Dried blood in the form of cakes grinds easily and can be used alone or mixed with other manures. It is estimated that about 10,000 tons of dried blood could be produced from the slaughter houses in the country.

Other material available from the slaughter houses consists of pieces of skin and rejected meat etc., which, mixed together, are generally known under the trade name of 'tankage'. Tankage varies greatly in its chemical composition depending upon the various constituents forming it. It may contain from 3 to 10 per cent of nitrogen and from 7 to 20 per cent of phosphoric acid. These products can be a source of income to the Municipalities, if proper methods of conserving blood and tankage are adopted. The material prepared will soon find a market as a good fertiliser for fruits and vegetables.

The hoofs and horns of dead animals are collected in this country along with the bones. At the assembling centres they fetch higher prices than the raw bones and are, therefore, crushed separately. A considerable quantity is at present exported. The horn meal contains about 15 per cent nitrogen and can be utilised as a fertiliser with advantage.

33. Bonemeal is a good form of phosphatic manure which contains organic matter and some nitrogen also. It is suitable as a manure for all types of soils, more particularly acidic soils, where superphosphates cannot be used. Apart from its phosphatic value, bonemeal helps to increase the phosphorous content of grain and thus enhances its nutritive value. Sterilised bonemeal is also a valuable cattle feed, and its use in this form has great scope.

34. The average annual collection of bones amounts to about 1,50,000 tons. This is only one-fourth of the estimated quantity available judging from the number of cattle that die in a year. It is possible to crush bones completely as bonemeal, but crushing factories, interested in the more lucrative export trade of grist, do not produce the maximum amount of bonemeal. The demand for bonemeal has also to be built up. At present 25 per cent of the bones is converted into bonemeal and the remaining 75 per cent is exported as grist for which there is a considerable demand in foreign countries as it is a source of glue and gelatine. The export of bonemeal is prohibited and the whole of it is used internally as manure. The high price fetched by the export of grist enables the crushers to make bonemeal available at comparatively low prices.

35. The export of bones from India has been going on for a long time. The earliest record is for the year 1884-85, when 18,000 tons were exported. Since then exports have steadily increased and between 1884 and 1951, a total of about 4 million tons of bones have been exported. This export has been criticised on the ground that it deprives the Indian soil of a valuable manurial constituent which should return to it. Indian soils are known to be deficient in phosphates. While grist, which could be converted into bonemeal, is exported, the phosphatic deficiency is sought to be met by importing rock phosphate and converting it into superphosphates. Grist certainly does fetch high prices and there is some saving to the country in the export of grist and its substitution by superphosphates as a source of phosphatic fertilisers. On the other hand, the supply of organic matter and nitrogen is a feature of bonemeal which is not present in superphosphates.

36. In order that the export of bones should cease, steps must be taken to manufacture by-products, like glue and gelatine, in India. Increased crushing capacity should also be provided, particularly in areas far away from railheads, so as to stimulate better collection of bones. Our attention has been drawn to a bone digester which has been lately imported from Japan. Bones are steamed under pressure, and fats and glue are extracted; thereafter the bones become so brittle that they can be crushed in any pounding machine. The bonemeal thus obtained can be used as manure as well as cattle-feed. The collection of bones will increase only if crushing units or plants like the bones digester are located in areas where collection is not paying because of the long distances from railheads. If any State considers it necessary to impose a provincial ban to enable it to increase the crushing capacity in the rural areas, such a request from it should be favourably considered by the Centre.

37. Coming now to inorganic or synthetic fertilisers, the most important nitrogenous ones are ammonium sulphate, ammonium nitrate, calcium nitrate, ammonium phosphate and urea. The important phosphatic fertilisers are superphosphate, rock phosphate, and ammonium phosphate. In the past 50 years several types of nitrogenous and phosphatic fertilisers were introduced into this country and experimented with at the different experimental stations. Of these, ammonium sulphate and superphosphate are most in use today, and these are at present being manufactured in the country. Ammonium sulphate requires for its manufacture gypsum which has to be transported over long distances. Superphosphate is manufactured mostly from imported rock phosphate and sulphur or sulphuric acid. In

the Indian Union there are no rich deposits of sulphur and the supply position of sulphur in the world is difficult. It is, therefore, desirable that the possibilities of manufacturing ammonium phosphate, which supplies both nitrogen and phosphorous to the soil should be investigated. Deposits of rock phosphate are reported to exist in India and the fertilising value of ammonium phosphate has already been established by field experiments in different parts of the country.

38. There has been some criticism of the introduction of chemical fertilisers without full steps being taken to mobilise all the manurial resources of the organic type. This criticism, in so far as it stresses the necessity of mobilising these resources, is just, but the process is bound to take some time as it necessitates the disturbance of age-old habits. We do not consider that it is necessary to wait for such full mobilisation before introducing chemical fertilisers. The two processes should and can go on simultaneously. Both these types of manure are necessary for maintaining and increasing soil fertility. It is well known that a continuous application of chemical fertilisers only, without the support of any bulky organic manure, leads in course of years to soil deterioration and progressively lower yields. It has, therefore, been a practice to recommend the use of chemical fertilisers, more particularly ammonium sulphate, in conjunction with bulky organic manures.

Phosphate is best applied to leguminous crops for this not only helps the growth of that crop but also thereby augments the quantity of nitrogen added to the soil which increases with the yield of the leguminous crop. This is, therefore, a useful method of supplying the soil with the nitrogen and phosphorous so much needed for cereal crops.

39. The fact that fertilisers are in demand today shows that their use is profitable to the cultivators. But their high prices in recent years have resulted in larger quantities being utilised for commercial crops in preference to food crops. Unless, therefore, the prices of fertilisers are substantially reduced so as to be within the reach of the grower of foodgrains, any expansion of the use of fertilisers for food crops will be difficult.

40. The problems relating to the conservation, production, distribution and utilisation of manures and fertilisers are sufficiently large and important to warrant their being kept under review by a competent body of experts. We recommend the appointment of a Committee of the ICAR charged with the following functions :—

- (a) to review annually and to obtain accurate information on the potential supply of manurial resources and the quantities actually developed and utilised ;
- (b) to estimate the country's manurial and fertiliser requirements, the potentialities for production in different parts of the country and the optimum conditions for their utilisation ;
- (c) to estimate the response obtained by the use of fertilisers and their economic cost to the cultivators ; and
- (d) to report on the development of the utilisation of manures, human and cattle wastes, green manures and fuel gas.

AGRICULTURAL IMPLEMENTS AND MACHINERY

41. Though State and Central Governments have paid considerable attention during the last 20 years to agricultural research, comparatively little has been done to improve indigenous implements. The Governments of Madras, U. P., and the Punjab have achieved something in this direction and so have educational institutions and manufacturers, but no definite schemes were drawn up nor was the work systematically followed up until the Agricultural Engineering Section was added to the Indian Agricultural Research Institute in 1945.

42. Agricultural implements may be classified broadly into the following categories : implements (a) for preparing the seed bed ; (b) for cultivation operations ; (c) for harvesting and threshing work ; (d) for processing and utilisation of agricultural produce ; and (e) for lifting water. Attention has been hitherto devoted mostly to improvement of the implements used for processing the produce and lifting water. Improved sugarcane crushers, the Persian Wheel, and the Revolving Drum illustrate this tendency. There exists considerable scope for improving the efficiency of implements used for seed bed preparation, planting, cultivation and harvesting operations.

43. While Dr. Stewart considered that as long as the land is kept free from weeds it makes little difference to crop yields whether ' *desi* ' implements or improved implements are used, it is generally accepted that by using improved implements a larger area can be covered in the same time, and the timely performance of agricultural operations results in reduction of costs as well as better yields. For certain agricultural operations, *e.g.* turning under of green manure improved implements are essential. The need for encouraging research in this field is thus obvious. For this purpose we recommend that every State should have in its agricultural engineering section a whole-time officer for conducting research on indigenous tools and implements. Many of the existing agricultural engineering sections deal mainly with power drawn machinery, and a special officer is required to devote exclusive attention to the important subject of indigenous implements. The engineering section at the Indian Agricultural Research Institute will have to be similarly strengthened with a special officer. The section so established in the States and Centre should have adequate facilities for research and trials. Besides conducting research on indigenous implements the special officer at the Centre will try out imported implements. He will also co-ordinate the work done in various parts of the country and pass on the information regarding improved implements to executive agencies. It will be his responsibility to furnish the results of research to manufacturer for commercial development.

44. As implements have to be adjusted to crop, soil and climatic conditions, the research problems have to be examined on a regional basis, *i. e.* for a group of States. Regional Committees consisting of technical experts, enlightened farmers, representatives of the State Governments, manufacturers and dealers should therefore be set up by the I.C.A.R. The Committees should indicate the lines on which research and development work should proceed. They would also approve the schemes drawn up by the States and review their progress regularly. The special implement officer at the Indian Agricultural Research Institute

should act as a convener of the regional committees. The Indian Council of Agricultural Research might also convene an annual conference on implements and machinery to which nominees of the regional committees, prominent research workers, and manufacturers should be invited. The programmes of research drawn up by the State and accepted by the regional committees should be accorded a high priority by the Council which should provide necessary financial assistance. It should also offer technical advice and follow a policy of sponsoring research on implements in all the important States.

45. Along with research, the difficult task of popularising improved implements and arranging their supply has to be tackled. This would also be the responsibility of the special officer to be appointed in every State. He will have to do this work with the assistance of the extension staff. As research gets organised in the States and at the Centre, new designs will be evolved. These designs and models will be supplied to the fabricators for manufacturing the implements on a commercial scale. It may be desirable to encourage the establishment of small fabricating units which will provide employment to rural artisans. These could be further developed into workshops where the manufacture of steel trunks, buckets and other utilities could also be undertaken. It would be advantageous to organise local fabricators and blacksmiths into co-operatives for undertaking production of implements. The implements manufactured should be recommended to cultivators only after careful trial and test by the implements officer of the State, who should be provided with the necessary equipment for carrying out tests.

46. As regards arrangements for distribution, the implements can be supplied direct by the dealer or from the government depots or through the co-operative societies. Taccavi loans or loans from cooperative societies may be provided to popularise new implements if their cost is high.

47. The facilities for the servicing and repair of implements and tools are not very satisfactory. The technique of the local blacksmiths and carpenters needs to be improved by organising a short training course at important centres. Co-operatives of fabricators besides undertaking production should also provide servicing and repair facilities at reasonable rates. In addition the machine tractor stations and workshops which are being established by the Central and the State Governments should also have a section for undertaking repairs of indigenous implements. Spare parts needed for implements should also be stocked by the machine tractor stations and the co-operatives.

48. During and since the second world war cultivators have begun to use power driven machinery to a greater extent than before. Increased financial assistance under the G.M.F. campaign for the purchase of tractors, diesel engines, electric motors, has accelerated the process. The rising cost of labour as well as its scarcity in certain areas are other factors which have tended in the same direction. The rapid increase in the use of tractors in this country may be judged from the following table :—

	No. of tractors imported						
1949-50	3,318
1950-51	4,930
1951-52	7,400

49. The use of tractors has distinct advantages in certain operations such as : (a) reclamation of waste or weed infested lands ; (b) cultivation of lands in sparsely populated areas where there is a shortage of labour ; (c) drainage and soil conservation operations such as contour bunding, terracing, ridging, etc. The utility of tractors for reclamation operations has been demonstrated by the Central Tractor Organisation which has been working in the Terai areas of U.P. and the kans infested tracts of Madhya Pradesh, Madhya Bharat, and Bhopal. The States have also acquired some experience of this work during the last five years. The precise extent to which waste and fallow lands can be brought under the plough can be ascertained only after a detailed survey, but it is believed that out of 98 million acres classified as cultivable yet lying waste, about 11 million acres can be reclaimed in the near future. The Plan provides for reclamation of 2.62 million acres. While the pressure of population is generally heavy in the country as a whole there are thinly settled areas, particularly in Vindhya Pradesh, Madhya Bharat, Rajasthan, etc. where labour shortage is an important limiting factor in the expansion of cultivation. Reclamation by tractors and mechanised cultivation in such tracts has obvious advantages. Large areas can thus be developed either as State farms or for settlement of landless labourers on a co-operative basis.

50. While tractors can safely be utilised for the above purposes, care will have to be taken to see that their use for general cultivation work in other areas does not cause unemployment. The small size of holdings, the absence of avenues of employment other than agriculture, the shortage of fuel-oils and iron and steel are factors which militate against the use of tractors in this country for cultivation on any substantial scale and, by and large, Indian agriculture will continue to depend upon animal power for a long time to come. Even though tractors reduce labour costs and facilitate agricultural operations there is no conclusive evidence that they increase production, though they are a valuable aid when speed of operations is a relevant factor. It is reported that some of the bigger cultivators have acquired tractors recently because of a feeling that those who adopt mechanical means of cultivation will be accorded special treatment and allowed to retain larger holdings for personal cultivation in case a ceiling is imposed on existing holdings. This has led to displacement of tenants. This trend is likely to be maintained and may even increase unless protected tenancy rights are conferred on those who occupy the land as tenants-at-will and as sub-tenants. Some of the States have initiated action on these lines.

51. During the year 1951-52 tractors worth about Rs. 6 crores were imported into the country. Imports are likely to continue in future at this level and the total value of imported tractors during the Plan period may be around Rs. 30 crores. The imports include machines of numerous makes and designs from various countries. It is understood that about ten to fifteen per cent of the tractors remain out of use as many of them are not suitable for Indian conditions. Import and sale of machines whose utility has not been fully established, not only causes loss to the cultivators but also retards the pace of technological progress as the unfavourable experience of a few farmers discourages many others from making purchases. To avoid the wastage and losses that thus take place it is essential that imports of undesirable types of machines should be reduced to the minimum. For this purpose it is necessary that every

make of tractor received should be tested in regard to its utility under Indian conditions. The test may be carried out at a testing station to be established by the Government of India and imports regulated on the basis of the findings of the test. It should be possible to set up such a station at a cost of Rs. 2 to 2½ lakhs in addition to the recurring expenditure which may be in the neighbourhood of about Rs. 75,000. In this connection it would be an advantage to study the organisation of similar institutions which are operating in U.S.A. and U.K.

52. The cultivators also experience difficulty in obtaining spare parts and the arrangements for servicing and repairs are not always satisfactory. The Government have been trying to remove these difficulties but there is considerable scope for improvement. The Government should see that adequate facilities for supply of spares and repairs are provided either by the dealers or at the State workshop as this would reduce breakdowns, avoid dislocation and lead to better utilisation of the equipment.

53. Though some data are available regarding the cost of reclamation by tractors, a comparative and thorough study of the economics of mechanised and bullock-power cultivation has yet to be made. The I.C.A.R. might undertake such a study for various regions and crops.

54. Besides tractors, other power driven machines, electric motors, diesel engines, etc. are becoming increasingly popular in rural areas as water lifting appliances. The power available from these engines can also be used for other agricultural operations such as cane and oilseed crushing, grinding, etc. It is estimated that about 60 thousand diesel engines are required annually for agricultural purposes. To encourage their use many of the State Governments are providing assistance in the form of loans which the farmers can repay over a period of years. The testing station suggested in paragraph 51 above should also carry out tests on diesel engines and pumping sets, etc. so that the cultivators may be able to ascertain the makes which are inefficient or undesirable.

PLANT PROTECTION, QUARANTINE AND STORAGE

55. No systematic quantitative studies have been conducted so far to determine the losses caused by insect pests and plant diseases in India. The International Conference, organised by the Food and Agriculture Organisation in London in 1947, considered that in tropical and sub-tropical countries, where climatic conditions are conducive to a rapid multiplication of pests, the losses in storage alone might be estimated at about 10 per cent. The losses in the field, particularly in the case of epidemics, can be very severe.

56. The Plant Protection Organisation at the Centre consists of a Directorate, with the Plant Protection Adviser as its head, and three main divisions : (i) Entomology, (ii) Plant Diseases, and (iii) Quarantine. There is a Storage Entomologist and a Quarantine Entomologist and other staff to help the Adviser. The directorate advises the States on the control of various diseases and pests and helps them in setting up Plant Protection Organisations in their areas. The locust control work is also its responsibility.

57. The primary function of the Plant Protection Organisations at the Centre and in the States is to fight outbreaks in epidemic form, and they should be sufficiently equipped for this purpose. At the time of an epidemic, the extension and the plant protection staff together with the equipment and insecticides have to be moved to the affected place at short notice.

58. A secondary function of the organisations in the States is the investigation of plant diseases and pests and the prescription of measures for their destruction. Research and investigation must be directed towards evolving remedies and methods which can be adapted to the local practices of the cultivators and which will utilise local materials. Imported insecticides and pesticides should be recommended only after trials when local materials and methods have failed to achieve results.

59. The pests and diseases which occur during the various stages of growth of a plant are well known, and so are the methods of fighting them. In the case of diseases, preventive measures have to be taken, generally at the sowing stage. Both these measures assume a routine character and can be taken by the ordinary field staff with some previous training. No separate organisation for this work at the village level is necessary. Technical staff is, however, required to locate the focus of an onset, to devise special measures in the case of epidemics and to train the field staff. It is necessary to state these considerations as we notice considerable variation in the strength of the plant protection staff in different States.

60. It may be an advantage for each State to study over a period of years all outbreaks which have assumed an epidemic form and to trace the factors favourable for their growth and subsidence. If the results are shown on maps it would facilitate the location of centres of attack, the siting of plant-protection equipment and the determination of the strength of staff required. It may also help in forecasting epidemics.

61. The methods of control adopted for preventing damage to crops by insects and pests may be classified under four categories :

- (1) Quarantine,
- (2) Biological Control,
- (3) Cultural methods, and
- (4) Chemical treatment.

62. Quarantine is the prevention of entry of plant and animal pests and diseases from countries outside India. In the past, owing to lack of efficient quarantine arrangements, injurious insects entered the country and established themselves as pests. The requirements for efficient quarantine operations are that the plant material coming into this country should be fumigated. A fumigatorium with modern equipment was established at the port of Bombay a few months ago. The Plan provides for setting up quarantine and fumigating stations at Madras and Calcutta. Land frontiers and air ports have also to be guarded against both plant and animal pests and diseases.

63. Biological control involves employment of an insect to check the development of another insect pest or weed. A well known example of such control is the use of the cochineal insect for the eradication of prickly pear. A considerable amount of work has been done in the country during the past twenty years on the science and practice of biological control and methods have been in operation against sugarcane borers and neophanthes of coconut in the South. There are facilities for biological control work at the Indian Agricultural Research Institute.

64. Variation in cultural practice is another useful method of control. Introduction of resistant varieties of crops, changes in rotation, time of sowing or planting, deep and shallow cultivation, giving, or withholding of irrigation, are the usual methods tried. The system of control has the advantage that the results are obtained without any additional cost and do not depend on equipment which may not always be locally available. Change in the time of sowing wheat was a major factor in Hessian fly control, and a similar method has dealt effectively with the *Tirak* disease in cotton. The limitations of this method are, that a variation of cultural practice which prevents the onset of the disease or pest has also an adverse effect on crop yields, and the cultivator prefers the former risk. Sufficient stress has not been laid on these methods and there is a tendency to try out insecticides without fully investigating the possibilities of variation in cultural practices or other methods based on resources available to the cultivator.

65. During recent years the use of insecticides particularly D. D. T., B. H. C., and other similar chemicals has increased considerably and manufacture of D. D. T. and B. H. C., which are at present imported, has been visualised in the Plan. These chemicals are superior to those previously used because they act both as contact and stomach poisons. An ideal insecticide, however, is one which kills the harmful insect pests without creating any hazards to the consumer—human beings and cattle—of the plants to which it is applied. It should also not upset in the long run the biological balance in nature by destroying other beneficent forms of plant and insect life. More experience regarding the use of these insecticides and experimental evidence of their effect on human beings and cattle, who consume the straw and grain of the treated plant, is required before their extended use can be recommended. There is a difference of opinion regarding their after-effects even in the most advanced countries.

Organised guidance regarding the use of pesticides is also necessary in this country as at present different firms market a variety of brands without authorised tests of the claims made for their products. It should be the function of the Plant Protection Organisations to conduct experiments with the different brands on sale in the market and advise the extension agencies, etc, on the best material available.

66. As regards the manufacture of insecticides and fungicides, the possibilities of utilising indigenous material for this purpose should be more thoroughly explored. For example, pyrethrum has active ingredients of high toxicity to many common insects. Black mustard oil also has been claimed to have fungicidal value. The scope in this regard has to be examined as systematic cultivation of such crops would raise the income of the farmers.

67. It is difficult to calculate the loss due to pernicious weeds in terms of money, but in the case of severe infestation, the yield is considerably reduced. Weeds, such as *pohli* and *kandiari* in wheat, cause harvesting difficulties. Some tenacious weeds such as *baru* and *kans* get such a firm hold on the soil that the land goes out of cultivation. In the case of annual and biennial eradication of weeds, the treatment usually is their removal before seed formation, while perennial weeds are eradicated by deep ploughing and exposure of their stems and roots to the severity of the climate. In the United States weeds are being controlled on a large scale by the use of flame throwers and selective herbicides. A research scheme has been sanctioned by the ICAR for the investigation of the control of weeds by means of selective herbicides. While research is in progress for securing definite information on weedicides, control of weeds by mechanical and cultural methods should be encouraged.

68. During the present century there have been five locust cycles during which Rajasthan, Punjab, Pepsu, Saurashtra, Kutch, and parts of Bombay State have witnessed large scale invasions which often resulted in considerable damage. The permanent homes of locusts lie in extensive belts of Africa and countries of the Middle East. Locusts not only attack agricultural crops, but also forests and in fact any green vegetation available. The Government of India have maintained a Central Locust Organisation to fight this menace. This organisation is responsible for control operations in desert areas, while the States are incharge of the work in their cultivated areas. A fresh locust cycle which started in the year 1949-50 is still in progress and the Government have adopted necessary control measure which include spraying and dusting of chemicals on a large scale in the breeding areas. The attacks on crops in cultivated areas are met by mechanical and chemical methods such as the destruction of eggs by exposure after ploughing, burying them in trenches, etc. To intensify the campaign aid in the form of aeroplanes, helicopters and other equipment is being obtained under the Technical Assistance Programme.

69. The crops have also to be protected from stray cattle let loose either through carelessness or wilfully by unsocial elements. Such cattle when caught are impounded in cattle pounds. The charges levied for their release are often so small that they do not act as a deterrent. To reduce this nuisance it is necessary that heavier penalties be imposed and exemplary punishment awarded to habitual offenders. The Cattle Trespass Act should be amended to secure this. Damage by wild animals to crops and cattle is another menace in certain areas. Organised action against them is necessary as individual action only shifts the burden on to other cultivators. Destruction through gun-clubs, trench pits and similar methods is the only solution.

70. Losses in storage are also quite high. At the village level most of the surplus produce is marketed by the farmer soon after the harvest. Village storage is not, therefore, a major problem and the traditional system of storage is fairly satisfactory. It requires, however, to be further studied.

Losses are greater in the godowns and storage space in the assembling markets as they are continuously occupied and are generally maintained in a poor condition. In their case preventive measure against stored grain pests such as fumigation, super-heating and use of insecticides should be adopted on a wider scale. With the introduction of controls and government imports, steps were taken by the States to construct and lease storage accommodation. It is understood that the Central and State Governments have at present a storage capacity of about 51 lakh tons of which nearly 15 lakh tons are Government owned. The Directorate of Storage and Inspection are responsible for the disinfection and fumigation of the Central Government stocks, and also supervise the work in the case of the State civil supplies departments. The Civil Supply godowns are generally located at important railheads and *mandis* where the trade also has its facilities. It would be an advantage if the Civil Supplies staff also actively assist in the periodical inspection and disinfecting of the godowns.

AGRICULTURAL EDUCATION AND TRAINING

71. The ability of the extension service to appreciate the difficulties of the farmers and to render effective assistance in resolving them are factors which will largely contribute to the success of the agricultural programme. The extension staff, particularly at the village and tehsil level, has to be properly trained and equipped for this work. Provision of adequate teaching and training facilities for this staff is an important aspect of agricultural education. Another equally important but broader aspect is the education of the cultivators, so that they may practice scientific agriculture.

72. The main defect of the extension work carried on hitherto has been its relatively greater reliance on propaganda rather than on actual demonstration to the cultivator under his field conditions. This is largely due to insufficient stress being laid in agricultural institutions on practical work and on the correlation of practice with theory. The complaint that students from agricultural institutions prefer jobs to private agriculture largely arises from this drawback. A trainee must be moulded physically and mentally into the practice of the 'dirty hands' method, before he can be expected to demonstrate it successfully in the field, or practice it himself in his own cultivation. We commend the Manjri pattern of two year schools in the Bombay State as the best for ensuring that this background is sufficiently emphasised. These are boarding schools, and every item of work on the farm where the school is located has to be done by the students; servants are allowed on the farm only during the vacation period. The schools have the additional advantage of being less costly and of enabling the student to supplement his income, during the school period. They supply village-level workers, and also offer agricultural training to sons of cultivators. Their drawback is that a student passing out from such a school is not able to prosecute his studies further in an agricultural college. This handicap should be removed by extending the course by one year for those who want to prosecute their studies further. This may necessitate a special admission examination for them by the agricultural college.

73. All village-level workers are trained either at agricultural schools or in special training centres. The total number of schools in the country is 38 and ten more will be started during the Plan period. The training period in the schools generally extends from two to three years. We recommend that all existing schools should be converted into the Bombay type of school as early as possible. As the full requirements of the village-level staff cannot be met by the existing schools and a large number of village level workers are immediately required for manning the Community Projects, 30 special centres have been organised through the help of the Ford Foundation. The training period at these centres is only six months, as ordinarily the trainees have a previous training in an agricultural school or a knowledge of practical agriculture.

74. There are 22 agricultural colleges turning out annually about 1000 graduates, a large proportion of whom are employed by the Agricultural Departments for extension, research and educational work. These colleges, even in a greater measure than the schools, suffer from the same complaint of insufficient stress on practical work. Recognising this drawback the Indian Council of Agricultural Education, recently set up by the Indian Council of Agricultural Research, has suggested that the course should include supervised intensive practical training under rural conditions for a period of two months every year. Another drawback of college education is the absence of facilities for specialisation in extension and farm management. Post-graduate education in research only is available. The result is that the responsibility for extension work or management of farms falls on a person, who has only received a general education in agriculture. A person would be better qualified for service either in the extension or farm management branch, or in the research and teaching branch after he has intensively studied these subjects. If the agricultural college course after graduation is considered too long for these qualifications, facilities should be provided for a bias in the field of special interest in the final year.

75. Short practical courses for farmers of a general nature in different fields of agriculture, such as compost making, pre-sowing treatment of seed, crop protection, cattle feeding, etc., have proved to be of great value. They can be held on each Demonstration Farm at suitable intervals.

AGRICULTURAL RESEARCH

76. Prior to the constitution of the I.C.A.R. in 1930, agricultural research was carried out in the Indian Agricultural Research Institute at Pusa and in the research institute attached to the Departments of Agriculture in the various States. The Royal Commission on Agriculture found that 'there was lack of sufficiently close touch not only between Pusa and the provincial departments but also among the provincial departments themselves'. The Indian Council of Agricultural Research was, therefore, constituted in 1930, with the object of promoting, guiding and co-ordinating agricultural research in India.

77. In the course of research work a vast amount of valuable information has been obtained and striking results have been achieved particularly in the field of plant breeding, utilisation of manures and fertilisers and plant protection. The use of improved varieties of seed, pre-sowing

treatment of seed, preparation and utilisation of compost manures, utilisation of fertilisers, etc., are some of the results of research which have come to form a part of an enlightened cultivator's agricultural practice. But the lack of a properly trained extension service has retarded this process. The recommendation of the G.M.F. Enquiry Committee is that such a service should be available throughout the country within a period of ten years, and a beginning is being made in connection with the Community Projects. An extension service helps to connect the research centre with the farmer in the field—his problems being brought to the research centre and new discoveries being carried to him. The absence of such a service has had its effect on research work also, in that the demands on research workers were not sufficiently insistent or pressing and tended to be unrelated to the practical needs of the cultivator. Now that the foundation of an extension service for India is being laid, it is of the utmost importance that for each soil, climate and region a compendium should be prepared, for the use of the extension service, of the various research practices which have been sufficiently proved for immediate adoption by the cultivators of the region, and of those which require further proof by trials in the cultivators' fields. The I.C.A.R. should actively help the States in the preparation of these compendiums by a financial grant, if necessary. It may be necessary to appoint a special officer in each State for this purpose who will work under the guidance of the Agricultural Commissioner.

78. Agricultural research is of a continuing nature. New knowledge has to be gained, and fresh problems tackled. With this object Dr. Stewart had recommended the location of research and experimental stations in carefully selected centres for each crop soil-region. Unless these are established, or existing research centres converted to the attainment of these objectives, extension work may soon come to a standstill. These stations have been of great significance in the agricultural development of Japan, and we consider that the establishment of such stations should be an important concern of the I.C.A.R. and the State Governments.

79. The functions of the I.C.A.R. in respect of promoting, guiding and co-ordinating research work were masked to some extent by the growth of research by organisations over whose research programmes it had imperfect control *i. e.* the States, the Commodity Committees and the Central Research Institutes. Research work in the States may be divided into two categories :—

- (i) schemes sponsored by the I.C.A.R. by sharing a portion of the cost, and
- (ii) schemes, the cost of which is borne entirely by the States.

The latter category of schemes were never formally examined or considered by the I.C.A.R. Its annual review only related to the schemes the cost of which it shared. The same was the case with the programmes of the Commodity Committees which were only sent to the I.C.A.R. for information. The Central Research Institutes also drew up their own programmes and the I.C.A.R. had no voice either in their framing or their modification. The I.C.A.R. was thus till lately largely confined to the research programmes the cost of which it shared with the State Governments. No overall review or co-ordination of research under such conditions was possible.

80. The idea underlying the Commodity Committees, which between 1921 and 1949 were established for cotton, jute, tobacco, sugarcane, oilseeds and other commercial crops, was that quick results could be obtained if a Special Committee representing all interests concerned with the commodity, *e.g.*, growers, traders, processors, etc., was charged with the function of advancing research in that commodity. These expectations have been fulfilled, and some Committees have done good work. But this exclusive attention to the problems of one crop led inevitably to the disregard of the problems of other crops grown in the same region. This type of crop-wise compartmentalisation of research was discouraged by the Royal Commission on Agriculture in 1929 and also later by Dr. Stewart in 1946. His view was that the functions of Commodity Committees should be confined to problems which arise after a crop is grown, *e.g.*, processing, marketing, etc. but so far as agricultural research is concerned, it must comprise all crops grown on a soil, in the interest of allround agricultural development. "We must start with the soil and consider it in relation to all the crops which it is asked to grow, rather than starting from the opposite direction involved in the widely accepted policy of sectionalising research into a series of crop compartments". Another drawback of the Commodity approach is that it involves earmarking of funds in respect of particular crops, and prevents a balanced allotment of finances, according to the needs of the different crops. And this has actually happened. Relatively much more work has been done on crops under Commodity Committees than on other crops like millets, wheat and rice, though their importance in the national life is equally great, if not greater.

81. A logical result of the acceptance of the commodity idea would be to have Commodity Committees for each important crop in India. But today they are confined only to the commercial crops, like cotton, jute, sugarcane, oilseeds, cocoanuts, arecanuts, tobacco and do not include important food crops, like wheat, rice, pulses, millets, potatoes, etc. At a later stage, it appeared that instead of Commodity Committees, All-India Institutes for research in respect of food crops should be started, and we have all-India Research Institutes for rice and potatoes. But, as already indicated, there is considerable doubt whether crop-wise organisation of agricultural research is the best form of organisation ; and in some cases it is impossible. This may be illustrated by the example of the crops grown in the south-west corner of India. This area grows valuable crops, like pepper, cashew nuts, cardamoms, cloves, lemon-grass, etc. A single organisation for research and development of these crops would lead to expeditious and coordinated action. Such a regional body could well have delegated to itself the functions of the I.C.A.R. A commodity approach here is an impossibility.

82. The Central Research Institutes are the I.A.R.I. at Delhi, the Potato Research Institute at Patna, and the Rice Research Institute at Cuttack. The I.A.R.I. carries out fundamental research but its research programme is not coordinated by the I.C.A.R. with the research programme of the rest of the country. Apart from this drawback, the I.A.R.I. provides the back ground against which applied research is carried out over the rest of the country.

83. The same cannot be said of the Potato and Rice Research Institutes. Ordinarily there are no fundamental problems with respect to individual crops which are unrelated to the ecological conditions in which they are grown, and which would, therefore, have an all-India

application. Even special work like cross-breeding with foreign varieties can be done in Research Stations, all over the country, and Central Institutes for particular crops do not appear to have a special advantage. Their present usefulness lies in enabling research men of high standing to work in a well-equipped laboratory, a facility which a State might not be able to afford on its own.

84. The role of universities in promoting agricultural research is a question which needs attention. Although universities are eminently suited for such research, especially of the more fundamental type, they have not taken it up to any significant extent in the past, owing perhaps to lack of funds and other causes. It is a striking fact, for example, that there is not a single chair of genetics in any Indian university, although breeding of plants and animals, which rests on the foundation of this science, has been in progress in the country for several decades. It is important that whatever limitations there may be in the way of the universities taking an appropriate part in agricultural research should be removed and the universities encouraged to make their contribution to research. This will benefit the universities also by bringing their scientific staffs into direct contact with real problems which are in urgent need of solution for the betterment of the vast majority of our people.

85. India is now embarking on a vast programme of agricultural development. It has before it the ambitious target of doubling agricultural production in the next fifteen years. An extension service, which will cover the whole country in a ten year period, has been proposed to be constituted. The pace of agricultural development largely depends on the speed with which solutions to the practical problems of the cultivators are found by research workers. The whole organisation of agricultural research in India will have to be geared to fulfil this task. The ICAR was constituted in 1929, and its work was subsequently reviewed in 1937 by Sir John Russell and some aspects of it in 1946 by Dr. Stewart. We feel that the stage has now been reached when a high level committee should examine the whole question of the organisation of research in India, and, in particular, the changes that should be brought about in the existing Commodity Committees and Central Research Institutes and research in universities so that they can answer the increased demands for research that will be made upon them. As things stand today, the I.C.A.R. organisation has to examine a large number of schemes, and it may have to be considered whether some regional decentralisation could not be usefully introduced.

86. In the meantime, we suggest that the following measures should be immediately adopted to remove some of the drawbacks which affect the Commodity Committees and the organisation of the I.C.A.R.

(a) All schemes of the Commodity Committees should be subject to examination and scrutiny by the same body which examines the research schemes pertaining to other crops grown in that area. This would ordinarily be the Standing Scientific Committees of the I.C.A.R. It would be the function of this body to suggest what other schemes should be undertaken on crops grown in the same region to ensure all-round agricultural development and a balanced growth of research in that area.

(b) Wherever any research station is working under any Commodity Committee, the same staff should also carry out the research in respect of other crops in the area.

(c) The I.C.A.R. should have authority to suggest to a Commodity Committee what co-ordinated research in respect of other crops grown in the region or rotational crops grown with the main commodity should be undertaken by it.

In order that the I.C.A.R. may be enabled to discharge its statutory duty of co-ordinating all agricultural research in the country, it should be in a position:

(a) to review all research work done in the country. All research programmes, whether of the Commodity Committees, State Governments, or Central Institutes, should be sent to this body for scrutiny and approval. Appropriate dates could be specified for the receipt of these programmes, so that all programmes are received at a time and considered together;

(b) to undertake a detailed examination of all research programmes received. The I.C.A.R. today tries to discharge this duty through Scientific Committees, which meet for a few days just before the annual meeting of the Advisory Board and the Governing Body. Such a procedure does not permit a detailed and proper examination. We suggest that these bodies should meet more frequently, and at least twice a year, once for examining the schemes received by the I.C.A.R. and once for assessing their progress. These meetings should allow sufficient time for a proper examination of these schemes ;

(c) to take an overall view of research in the country as a whole, assess the result of the past years' working and indicate the direction of future research. The Research Board which has been recently constituted by the I.C.A.R. is expected to perform this function. It must consist of top-ranking agricultural scientists in the country on whom would fall the ultimate responsibility of guiding and co-ordinating research in the country ;

(d) to initiate research into utilisation of agricultural products which today go to waste. Such utilisation has an important bearing on the agricultural economy and no work in this direction has so far been done.

87. A matter which we would like to emphasise, particularly in connection with the research programmes in the States, is the need to associate representatives of progressive cultivators, traders and processors with the drawing up of annual research programmes and their evaluation. Though many of the problems of cultivators will be brought up by the extension service, such association will provide a more direct opportunity for the inclusion in the research programmes of matters which directly interest them.

88. The conditions of employment of the research workers is an important factor in determining the quality and quantity of the work done. In this respect the research workers employed in the projects sponsored by all India organisations, such as the I.C.A.R. or Commodity Committees, suffer from the handicap that their tenure is temporary as the schemes on which they work are sanctioned for limited periods. Although it may be argued that a research worker is actually seldom thrown out of employment, the feeling of insecurity is always there. This needs to be removed and the research services brought more in line with other permanent services under the Government. As far as the human element in research is concerned, the important pre-requisites for the production of satisfactory results are stability of service and congenial conditions of work and proper guidance and direction.

CHAPTER XIX

ANIMAL HUSBANDRY

ACCORDING TO the 1951 livestock census there are 150 million cattle and 43 million buffaloes in the country. Bullocks are the principal motive power available for agricultural operations. To a large number of people who are vegetarians, milk and milk products constitute the main source of animal protein. The importance of livestock to the economy of the nation can be judged by the fact that their annual contribution to the gross national income has been estimated at about Rs. 1,000 crores. This excludes the value of the animal power for draft purposes in agriculture and transport.

2. The total bovine population of undivided India as ascertained at the quinquennial census from 1920 onwards was as under :—

Year	Number in millions	Variation taking 1920 as the basis
1920	145·8	100
1925	151·0	104
1930	154·6	106
1935	153·7	105
1940	147·7	101
1945	144·5	99

The figures for the 1950 census which relate to the Indian Union have not been included in the above table as these cannot be compared with the previous figures which are for undivided India.

3. It will be seen from the above figures that the variation is slight, the maximum being 6 per cent. The small variation may be accounted for by marginal errors and it may be said that the cattle population of India is tending to be stationary. What is the relation of this population to the country's resources and requirements ? It is estimated that the quantity of fodder available is about 78 per cent of requirements while the available concentrates and feeds would suffice only for about 28 per cent of the cattle. As concentrates are usually given only to animals which are heavily-worked either for milk or draft purposes, it can be said that two thirds of the cattle can be maintained in a fair condition on the existing fodder and feed resources.

4. The overall estimates made by the Cattle Utilisation Committee show that about ten percent of the cattle population or roughly 11·4 million adults are unserviceable or unproductive. These estimates relate to the country as a whole, and the position varies in different

zones. A study of the 1951 census figures shows that the ratio of dry and other cows which are not in milk with those in milk differs very considerably. While in Madras, Mysore, Orissa, Bihar and Travancore and Cochin there are more than 200 dry cows for every 100 milk cows over three years of age, the number declines in Madhya Pradesh and Uttar Pradesh to about 150 and it is as low as 75 in the Punjab. The figures indicate that in the rice belt and the south a comparatively larger number of unproductive cows are maintained. The normal ratio of dry animals to those in milk should be 1 to 1, and the high ratio in the above regions imposes an avoidable strain on the country's resources. Measures for upgrading the cattle and removing useless and inefficient animals to *Gosadans* should, therefore, receive high priority in these areas.

5. As regards requirements of bullock power for cultivation and draft purposes calculations made on a basis suggested by Dr. Burns indicate that in U. P. and Bihar there is a surplus of about 4 million bullocks ; but while some farmers with small holdings maintain bullocks which are not fully utilised, in certain areas of these States there is a shortage of bullock power. It would not be correct to assume that there is surplus bullock power in each and every State. For instance, in Pepsu and Punjab the number available is just adequate to meet the needs. But the efficiency of draft cattle is low and, according to Dr. Burns, could be increased by 60 per cent for the country as a whole.

6. To sum up, the available feeds cannot adequately sustain the existing bovine population. While there is a deficiency of good milch cows and working bullocks there exists a surplus of useless or inefficient animals ; and this surplus, pressing upon the scanty fodder and feed resources, is an obstacle to making good the deficit.

7. The improvement of cattle involves, firstly, the selection of high class animals which are to be found mixed up in India's vast cattle population and their utilisation for up-grading the large number of non-descript cattle ; and secondly, provision for these of an adequate quantity of well-balanced feed, protection against diseases and efficient management.

Work on cattle improvement has been done by the Government, by cattle breeders and by charitable agencies. Among the well-defined breeds in India there are three broad divisions, *viz.*, milch, draft and dual purpose breeds. Recent investigations have indicated that some of the draft breeds are potentially capable of yielding more milk and this capacity can be developed by proper methods of breeding and management. There is thus a possibility of most of the breeds of Indian cattle being developed eventually into dual purpose animals and this is the prime objective of the breeding policy of the Government of India.

The buffalo population in India consists of several indigenous breeds, but not much concentrated work has yet been done on their improvement. The development of buffaloes has now been included in the key-village scheme discussed later in the chapter.

8. Approximately 750 farm-bred bulls of known pedigree are distributed annually by the government in different States for developing draft as well as milch breeds. Besides, there are approved bulls belonging to private cattle owners. But the existing number of approved bulls

meets less than 0.5 per cent of the total requirements of the country. The distribution is defective in that there is no concentration of effort with the object of achieving sustained results. In the absence of arrangements to castrate or remove the inferior bulls before a pedigree bull is located in an area, the progeny of the pedigree bulls have access to scrubs which nullifies the efficiency achieved in the first generation. A programme of cattle improvement should, therefore, include arrangements for the production and use of an adequate number of superior bulls of known parentage and productivity and the elimination of inferior and unapproved bulls.

KEY VILLAGE SCHEME

9. This work is proposed to be taken up at 600 centres under the key-village scheme during the period of the Plan. Each centre will consist of three or four villages having altogether about 500 cows over three years of age. In these areas breeding will be strictly controlled and confined to three or four superior bulls specially marked out and maintained by the farmers for the purpose. The unapproved bulls will be removed or castrated. Other essential features of cattle development, namely, maintenance of records of pedigrees and milk production, feeding and disease control, will receive full attention at every centre. The technique of artificial insemination will also be utilised in these areas as it will accelerate progress and reduce the requirements of bulls. About 150 artificial insemination centres at the rate of one per four key villages are proposed to be established during the period of the Plan.

10. The key villages are thus almost similar to the seed multiplication farms. During 1951-52, a beginning was made by the sanctioning of 94 artificial insemination centres with 196 key villages around them. So far 60 artificial centres and 150 key villages have started work and arrangements are in progress for the rest. The targets for the establishment of key villages, artificial insemination centres and bull rearing farms under the key village scheme during the course of four years are given below :—

Year	Number of key villages	Progressive total	Number of A. I. centres	Progressive total	Number of bull rearing farms*	Progressive total
1952-53	196	..	94	..	..	..
1953-54	206	402	24	118	..	..
1954-55	94	496	10	134	125	125
1955-56	104	600	16	150	100	225

When in full swing this scheme is expected to produce about 60,000 bulls per year. Each Community Project will have an artificial insemination centre at a convenient place with four key villages attached thereto. It would also be an advantage to locate some of the key villages in the suburban areas around the important cities, where development of dairy farming has been recommended.

*Provisional and subject to review.

11. The success of the key village scheme largely depends upon the measure of public support that it invokes. Selection of only high class bulls coming from strains which have proved their value and are suitable to the tract is the most important factor for the success of the scheme as it will be difficult to retain the confidence of the villagers if in the initial stages ill-chosen bulls give poor results. The effects of such mistakes may be aggravated through artificial insemination centres. Sufficient supervisory and expert staff has been included in the scheme to reduce such mistakes to the minimum. A proper administration and technical organisation consisting of one Veterinary Assistant Surgeon, one Milk Recorder and three Stockmen has been provided for every centre. They would assist the villagers in implementing the programme.

12. The improvement of common grazing grounds, the growing of fodder crops in suitable rotations, the preservations of surplus monsoon grass, the use of hitherto untapped fodder resources, etc. are matters which would receive due attention in the selected villages. Demonstration under village conditions are essential as conditions on Government Farms are not always similar to those in the villages.

13. To facilitate the castration of scrub bulls and the protection of animals against contagious diseases legislation will have to be introduced. The States of Assam, Bombay, Madhya Pradesh, Madras, Orissa, Punjab, West Bengal, Kashmir, Mysore, Ajmer, Delhi and Himachal Pradesh have passed the Control of Contagious Diseases Act while Bombay, Madhya Pradesh, Madras, Travancore Cochin and Delhi have passed the Livestock Improvement Act. Orissa and Coorg have the Livestock Improvement Act under consideration. It is essential that the other States should adopt these two Acts as early as possible.

GOSADAN SCHEME

14. The problem of unproductive cattle and its impact on the economy of the country has already been referred to. Though the availability of fodder and feed will increase to a certain extent as targets of additional production, particularly food grains, are realised, the benefit derived would not be of much consequence as the per capita increase would be insignificant. Malnutrition is to a great extent responsible for the disproportionately large number of dry animals. The census returns show that out of a total of 48 million cows over three years of age as many as 28 million are dry. The removal of useless cattle to areas of natural grazing or tracts where fodder supply is not being utilised has, therefore, been accorded a high priority in the Plan for livestock development. The Plan in this connection provides for establishing 160 *Gosadans* at a cost of about Rs. 97 lakhs. Under this scheme, all old infirm and useless cattle will be segregated and sent to *Gosadans* located in wasteland, in forests and other out-of-the-way places where cattle grazing facilities exist which have not hitherto been utilised. The male stock will be castrated. The remains of the dead animals such as hides, skins, horns, hoofs etc., will be fully utilised by setting up a small tannery at each centre.

15. The following programme is envisaged during the period of the Plan under the *Gosadan* scheme :

Year							Number of new Gosadans	Progressive total
1952-53	.	.	.	.	.	.	35	35
1953-54	.	.	.	.	.	.	75	110
1954-55	.	.	.	.	.	.	50	160
1955-56	.	.	.	.	.	.	NIL.	160

Each *Gosadan* will maintain about 2,000 cattle. In 1952-53, therefore, the *Gosadans* will remove from the improvement areas 70,000 animals, in 1953-54 220,000 and in 1954-55 320,000. In removing cattle, preference will have to be given to areas of intensive cattle improvement, that is, key villages. Surplus cattle from the key villages will, therefore, be sent to the *Gosadans* in the first instance.

These measures by the States will, however, touch only the fringe of the problem. It is considered that this movement should receive wide public support especially from charitable institutions like the *Pinjrapoles* and *Gaushalas*.

THE FODDER AND FEED PROBLEM

16. An important aspect of livestock improvement is the proper feeding and management of the animals. The effects of better breeding can be largely negated if the animals are not properly fed and looked after. Some experts think that feeding alone can bring about an increase of 30 per cent in the milk production of cows. The supply of green fodder so necessary for the healthy upkeep of cattle and milch cows is not only meagre, but erratic. In order to improve the supply leguminous fodders such as lucerne, berseem, cow peas, field peas, etc. should be introduced in crop rotations in irrigated areas. This practice will give nutritious fodder and will also help to increase soil fertility. The possibilities of kudzu vine and clovers etc., should be explored. Kudzu can be successfully grown on steep slopes in regions of good rainfall both for grazing purposes and for checking soil erosion, while clovers can be used for improving the pastures wherever irrigation facilities are available. In improved pastures there must be an emphasis on rotational grazing and wherever feasible pastures should be seeded with napier grass. In the valleys of the foot hills, where surplus grass is available after the monsoon, the possibilities of hay making should be explored.

To begin with, action on the lines suggested above may be attempted in Community Project and key village areas. There is also considerable scope for research on fodder crops and in the possibility of evolving schemes for the supply of green fodder for the greater part of the year. In addition, research, on feeds like mango-seed-kernel and *jaman* seed, etc., should be continued.

DISEASE CONTROL

17. The benefits of improved breeds and better feeding are often obscured by the cattle falling a prey to epidemics. Besides causing a large number of deaths contagious and other diseases, reduce the vitality and the working efficiency of the animals considerably. The common animal diseases are rinderpest, haemorrhagic septicaemia, black quarter and anthrax. Of all the diseases that affect Indian cattle, rinderpest is the most important and is responsible for about 60 per cent of the total mortality. The Government of India have, for some time past, been examining a scheme for the eradication of rinderpest by large scale vaccination with the newly evolved lapinised vaccine. A sum of Rs. 15.7 lakhs has been provided in the Plan to initiate this work.

18. It is also necessary that every State should have adequate facilities for the protective treatment of cattle. At present there are about 2,000 veterinary dispensaries in the country. The Plan provides for expansion of these facilities and during the next five years the total number is likely to go up to about 2,640. This would mean an increase of 32 per cent over the existing number. The phasing of the programme is as under :—

Veterinary Dispensaries of State and Local Bodies

	1950-51	1951-52	1952-53	1955-56
Part A States	1311	1380	1486	1733
Part B States	623	666	725	806
Part C States	58	69	81	101
TOTAL	1992	2115	2292	2640

POULTRY

19. Poultry keeping is an important subsidiary industry of the poorer classes in the rural areas, and can be a useful source of income to them. Eggs are a very valuable food and the population would benefit by increased consumption of them. The number of poultry in the country is estimated at about 70 million, but the ordinary village hen is generally undersized and lays only about 50 under-sized eggs in a year. Breeds like White Leghorn, Rhode Island Red, and Black Minorca may improve both the number and the size of the eggs. The Indian Veterinary Research Institute by a process of selective breeding has evolved an Indian strain which would step up the yield by about 100 per cent. This strain should be tested in the field under different soil and climatic conditions. One serious handicap of poultry farming has been the extreme susceptibility of poultry in this country to Ranikhet disease, but an effective vaccine has been recently brought out and the prospects of poultry raising appear to be now more favourable. The State Governments have provided a sum of Rs. 25.15 lakhs during the five year period for encouraging poultry farming. Selective breeding and proper development of poultry have also been included as a part of the key village scheme. It is hoped that in areas of intensive cultivation and in Community Projects areas necessary facilities will be offered to the cultivators.

SHEEP AND WOOL

20. The thirty nine million sheep of the Indian Union constitute an important source of wool and meat for the country. On an average, about 55 million pounds of wool are produced per year and about 31.6 million pounds of wool worth about Rs. 43 crores are exported from India mainly to the U.K. and U.S.A. Rajasthan alone accounts for nearly one third of the total production. The wool locally available is supplemented by about 19 million pounds of fine wool, which is obtained mainly from Tibet. The average yield of wool per sheep is two pounds which is very low. The quantity as well as the quality of the wool of the local sheep can be improved very considerably. For this purpose a plan of regional development has been drawn up by the I.C.A.R. Three regional centres will be established in important wool producing areas, *viz.*, the U. P. or Punjab hills, Rajasthan, and the Deccan Plateau and the quality of the sheep improved by selective breeding in the plains and cross breeding with the Merino breed in the hills.

VETERINARY EDUCATION AND RESEARCH

21. There are at present nine Veterinary Colleges in the country with an output of 275 graduates. In addition to these colleges, the Government of India maintain the Indian Veterinary Research Institute for post graduate training at Izatnagar, with a sub-station at Muktesar, U.P. During 1949-50, 75 students were enrolled and diplomas were awarded to 69 successful candidates.

In the Five Year Plan a sum of Rs. 84.43 lakhs has been provided for Veterinary education and training. Ninety-two per cent of this will be utilised in Part A States for the expansion of training facilities for veterinary graduates and stockmen. In addition, village level workers will also be trained in giving first aid to cattle.

The existing facilities at the colleges for higher studies are adequate, but difficulties are being experienced by some colleges in obtaining qualified teachers and research workers, especially in the fields of anatomy, surgery and physiology. It may be desirable for some teachers from the colleges to be sent abroad to acquire further training.

22. The total expenditure provided for the programme for livestock and animal husbandry amounts to Rs. 1432.52 lakhs the details of which are given below :—

	(Rs. in lakhs)
(a) Central Government—	
Key village schemes	293.53
Gosadan	97.15
Rinderpest	15.70
Other Schemes	5.64
TOTAL	412.02
(b) State Governments schemes—	
Part A States	754.3
Part B States	194.6
Part C States	71.6
TOTAL	1020.5
GRAND TOTAL	1432.52

CHAPTER XX

DAIRYING AND HORTICULTURE

FOR A country like India with a large vegetarian population, milk is a very important food. Despite this fact and the large number of milch animals in India, dairying is in a backward condition, and has not received the attention it deserves. Poor quality cattle, insufficiency of feeds and fodder, high incidence of disease and lack of organised production, improper handling of milk and milk products are problems requiring urgent attention. The improvement of cattle depends primarily upon a proper policy and programme for breeding and feeding. The measures necessary in this connection *i.e.*, schemes for key villages, *Gosadans*, artificial insemination and use of oil cakes as cattle feed etc. have been indicated earlier.

2. The average yield of milk per cow in India is 413 pounds which is about the lowest of any country in the world. The highest yield is 8,000 pounds in the Netherlands followed by 7,000 pounds in Australia, 6,000 in Sweden and a little more than 5,000 pounds in the United States of America. The low average production per animal is responsible for the over-all low production in the country.

3. Out of about 193 million cattle and buffaloes in the Indian Union, 70 million or about 36 per cent are milch animals *i.e.*, females over 3 years. Though buffaloes form only 30 per cent of the milch animals, they account for 54 per cent of the milk compared with 42 per cent yielded by the cows. This is due to the fact that a buffalo yields on an average 1,101 pounds of milk per annum and a cow only 413 pounds. Besides, buffalo milk is richer in fat and generally contains 6.5 to 7 per cent fat as compared to 4 to 5 per cent in the case of cow's milk. If milk were the only consideration, buffaloes would appear to be more useful than cows. The cow, however, has the advantage as its progeny also provides the motive power for cultivation.

4. According to the 1951 cattle census, the average *per capita* consumption of milk and milk products works out at 5.5 ounces, which comes to about 2.5 *chhataks* or $\frac{1}{8}$ th of a *seer* per day. The consumption of milk and milk products, however, varies considerably in different parts of the country. It is as high as 16.89 ounces in the Punjab and 15.72 ounces in Rajasthan, while in Orissa it is 2.64 ounces only. Except Punjab and Rajasthan all the major States are deficient in milk consumption by the standard of 10 ounces per day recommended by nutrition experts.

5. The gross annual milk production in 1945 was estimated at 21.42 million tons, of which 14.5 million tons only were marketable, the balance being either fed to calves or retained for home consumption. The production of milk in villages is on a small scale and scattered. The average daily production per village as given in the Report on the Marketing of Milk in

the Indian Union is only 2·5 maunds. There are, however, some 'milk pockets' or areas of concentrated milk production in the States of Bombay, Uttar Pradesh, Bihar, Madhya Pradesh and Saurashtra where large quantities of surplus milk are available during the flush season. Except in Bombay State, where milk is railed from Anand to Bombay city, surplus milk in other milk pockets distant from urban centres is generally utilised for the manufacture of *ghee* and *khoa*. Even though 95 per cent of the milch cattle are found in the rural areas where 86 per cent of the people reside, the effective demand for milk and milk products is found in urban markets.

6. The supply of milk to urban areas is unsatisfactory both in quantity and quality. This is due to lack of organised production in the surrounding villages, difficulties of transport, production of milk in urban areas under insanitary conditions and at high prices and its distribution by a host of middlemen. It is estimated that at present 60 to 70 per cent of the fluid milk requirements of the urban areas is derived from cattle maintained within the municipal limits. These cattle are generally kept in insanitary and congested conditions which affect their health, milk performance and breeding capacity. They are also a source of nuisance to the surrounding residential area. A majority of these animals when they become dry are sent to the slaughter house. Maintaining cattle in this manner is uneconomic and is a drain on the cattle wealth of the country. The remaining 30 to 40 per cent of the urban milk supply is derived from villages situated within 30 miles of the urban areas. The trade is in the hands of milk vendors whose methods of handling and transporting milk are neither efficient nor sanitary. A few *Pinjrapoles*, *Gaushalas* and Co-operatives are engaged in dairy farming for the supply of milk to urban areas. They, however, meet only a fraction of the total demand. There were also about 75 dairy farms in the Indian Union in 1949, most of which belonged to the Military and Civil Departments of Governments.

7. Urban consumers pay a high price for milk although it is of poor quality. According to a recent survey the retail milk price is higher in India than in any other important country. The high level of prices is principally due to shortage of supply. Measures for increasing milk production have, therefore, to be accorded the highest priority, especially as the *per capita* consumption is much below what is desirable from a nutritional standpoint. Proper arrangements are also necessary for the collection, transportation and distribution of milk. The work started in rural areas surrounding towns like Poona and Delhi for organising milk production and distribution on a co-operative basis has shown good results. The supply of milk to Poona has been increased in the course of about two and a half years from 332 lbs. to 8,240 lbs. per day. A sum of Rs. 2 lakhs was spent on purchasing good class animals and an artificial insemination sub-centre has been started in the suburban area. Feeds and concentrates are purchased wholesale resulting in a saving of 20 to 25 per cent. The quality of the milk is tested in the villages before collection and arrangements made for transporting it to the cities. The scheme has also benefited the consumers as they are able to get milk of good quality at reasonable rates. All this has been brought about at quite a small cost. The experience gained at Poona and other cities indicates the future pattern of development. It is, however, clear that in any scheme of urban milk supply the emphasis will have to be laid on increasing production in suburban areas, gradually shifting the cattle from the urban centres, and adopting strong measures of quality control.

8. The State Plans include 27 schemes for dairying and milk supply. They are estimated to cost Rs. 781.0 lakhs. The expenditure of Part 'A' States has been put at Rs. 770.3 lakhs, Part 'B' States—Rs. 3.3 lakhs and Part 'C' States—Rs. 7.4 lakhs. Among Part 'A' States Bombay has provided for the largest sum *viz.*, about Rs. 6 crores or 77 per cent of the total expenditure. This amount is proposed to be utilised for the supply of milk to the cities of Poona, Hubli and Ahmedabad. The West Bengal Government have earmarked a sum of Rs. 50 lakhs for the removal of dairy cattle from Calcutta to the adjacent farm at Haringhat and also for the supply of standardised milk to Calcutta proper.

9. The provision made in the Plan for milk supply schemes is inadequate except in Bombay. Even though the problems of a few cities may be tackled through the schemes envisaged in the Plan, many of the important towns and cities will not get any benefit. The problem cannot, however, be solved by government initiative alone. Better results may be had if the work of improving the milk supply is taken up jointly by the States, the Municipal Committees, the local *Pinjrapoles* and *Gaushalas* and producers' co-operatives.

10. We, therefore, suggest that a Milk Board be set up for each urban area. It should be a statutory body with a paid executive, consisting of representatives of producers, distributors, consumers, municipalities, health authorities and the State Government. A Milk Plan for the area would be drawn up by the Board after careful survey of needs. All matters relating to import, handling and distribution, quality control and prices of milk and milk products should be dealt with by the Board, which would also be responsible for organising production in the suburban and urban areas through a co-operative. The Plan would include removal of cattle from urban areas, a measure highly desirable both from the standpoint of public health and the conservation of the cattle-wealth of the country. The dislodged cattle and their owners may be rehabilitated by providing facilities for settling them in villages around the cities: The Co-operative would supply cattle fodder, feed and other requisites, would provide loans to the members for buying cattle, and would arrange for collection of the milk. The society would also look after the distribution of milk in the town either through its own depots or through licensed private milk vendors or agents. The financial assistance needed by the Milk Board and the co-operatives should be provided by the Government, the municipal committee and the co-operative bank. As the scheme would popularise mixed farming in suburban areas it should qualify for assistance under the Grow More Food Campaign. We also suggest that some of the key village centres may be located in areas surrounding the cities as the increased supply of milk obtained as a result of improved breeding and management will find a ready market in these urban centres. While these steps are being taken to augment supplies, the machinery employed for licensing, sampling, and testing would be strengthened by the Board and prosecutions hastened against the un-social elements who adulterate milk. The standards now in force in different urban areas in regard to the quality of milk and milk products will have also to be examined and revised wherever necessary.

11. As regards rural areas, improvement in milk yield would come about mostly by the better breeding contemplated through the key village scheme and by arranging better fodders and feeds. By achieving a target of food production of 7.6 million tons the fodder availability

would increase to the extent of about 14 million tons. Allowing for wastage etc. about 10 million tons of fodder would be available for consumption by the cattle. The problem of milk production and its greater use in rural areas is thus closely related to the overall rise in agricultural production and standards of living. There is, however, considerable scope for improving the production of *ghee* as its sale will bring additional income to the farmer and the use of its by-product, namely, butter milk will enrich his diet.

HORTICULTURE

12. Fruit and vegetables, like milk, can be a very useful element in the diet of the people. Although exact statistics are not available, the area under horticultural crops amounts to about 4 million acres, *i.e.*, about 3 million acres under fruit and 1 million acres under vegetables, which roughly means a little over one per cent of the total cropped area.

13. The production of fruit is estimated at about 6 million tons and that of vegetables at about 4 million tons. Allowing for wastage of about 25 per cent in the case of fruit, this production would permit of consumption of only about 1.5 ozs. per head per day and in the case of vegetables even less. According to nutrition experts 3 ozs. of fruit and 10 ozs. of vegetables per day are required for a balanced diet. There is, therefore, wide scope and need for increasing the production and consumption of fruit and vegetables. This can be achieved partly by increasing the area devoted to their cultivation and partly by adopting improved agricultural practices to get increased yields from the existing area. A substantial increase in production per acre can be brought about by removing some of the existing defects of fruit and vegetable-growing in this country *e.g.*, haphazard lay-out of the gardens, employment of inferior seeds and varieties, absence of regular pruning, training, and weeding, inadequate measures against insect-pests and diseases, lack of credit facilities and of arrangements for grading, packing, and marketing, and lastly want of readily available means of conserving the surplus by cold storage and preservation so as to prevent a glut in the market at the height of the season.

14. The State plans envisage a total expenditure of Rs. 121.22 lakhs on schemes relating to horticulture. Part A States account for about 90 per cent of this expenditure. The Schemes are of a varied nature, such as, research on fruit and vegetables, multiplication of vegetable seeds, supply of nursery plants, extension of the area under potatoes, etc.

15. For the further development of horticulture special consideration should be given to the following measures :—

- (i) Fruit growers in the principal fruit-growing regions should be assisted to organise themselves on co-operative lines for raising nursery plants, controlling pests and diseases, and for marketing fruit and fruit products.
- (ii) Suburban belts around large towns should be developed for raising fruit and vegetables and the growers organised on a co-operative basis, especially for the purpose of marketing their produce. Steps should also be taken to popularise kitchen gardening in urban areas by supplying seeds and plants and technical advice.

- (iii) The preservation of fruit and vegetables, which has been started on a small scale, should be expanded on modern lines. There are at present 467 factories with a total output of 10,000 tons valued at Rs. 1.63 crores. This is less than .02 per cent of the total produce. Research on modern and indigenous methods of fruit preservation should receive increasing attention at the hands of the Central and State Governments.

16. The Governments of some countries besides providing facilities for research, give assistance and encouragement to fruit and vegetable preservation in the following ways :—

- (i) sugar for fruit preservation is supplied at the world market rate,
- (ii) the import of machinery and other essentials is allowed either duty free or at concessional rates, and
- (iii) concessions are granted in freight rates for transport of raw materials to the canning factories and of the finished products from the canning factories to the centres of consumption of the ports.

With the development of horticulture the adoption of similar measures in this country for encouraging the preservation of fruit and vegetables will have to be considered. At a later stage it may be desirable to make available cold storage facilities at important markets and refrigerated railway wagons for transportation of horticultural produce.

17. The suggestion has also been made that a Fruit and Vegetable Development Board should be established in the Food and Agriculture Ministry which should be responsible for developing the industry on a country-wide basis by enforcing quality standards, supervising research, maintaining statistics and giving technical advice to States which need it. This suggestion deserves consideration.

CHAPTER XXI

FORESTS

FORESTS PLAY a vital role in India's economy. They are an important source of fuel and also of raw materials, such as, timber, bamboos, lac, gum, *katha*, useful for domestic, industrial and agricultural purposes. They also provide materials for defence and communications as well as grazing for cattle. Forests help in the conservation of soil fertility and play important part in the maintenance of the water regime of the land. The organic matter they yield improves the tilth and increases the water holding capacity of the soil thereby reducing the run-off. The presence of vegetation acts as a physical check to the velocity of the run-off and reduces its soil carrying capacity. Thus forests protect the hilly areas against excessive soil erosion. Similarly, they protect flat lands against dessication and erosion caused by winds. They exert a beneficial influence on the growth of agricultural crops and on the climate of the region in which they exist.

FOREST AREAS

2. Accurate statistics regarding the area under forests are not available. "Indian Forest Statistics" puts the area under forests in 1949-50 at 147.7 million acres (230,789 sq. miles) *i.e.* 18 per cent of the total land area as detailed in appendix I. This figure includes a considerable area of unwooded waste land, but no account is taken of tree lands and there are gaps in coverage in respect of many States. On the whole, however, it is reasonable to assume that the area under forests constitutes about 20 per cent of the total land area.

3. Compared with most other countries this is a low proportion. The Forest Policy Resolution of May 12, 1952, suggests that "India as a whole should aim at maintaining one-third of its total land area under forests. As an insurance against denudation a much larger percentage of the land, about 60 per cent, should be kept under forests for their protective functions in the Himalayas, the Deccan and other mountainous tracts liable to erosion. In the Plains, where the ground is flat and erosion is normally not a serious factor, the proportion to be attained should be placed at 20 per cent ; and in view of the pressure of agriculture, efforts at the extension of tree lands should be concentrated on river banks and other convenient places not suitable for agriculture". The gap between the aim outlined in this resolution and estimates of the area now under forests is very large. Further, the forests are confined mainly to the Himalayas, the Vindhya and the Deccan ; the Indo-Gangetic basin has been left almost bare. A planned extension of regular forests would be subject to the availability of adequate waste areas and the demands made thereon for agricultural expansion to meet the needs of the ever increasing population. We suggest that an immediate reconnaissance survey be made of

waste land with a view to evolving a system of balanced and complementary land use. We further recommend two-fold measures, namely :—

- (1) for each State, the proportion of the area that ought to be under forests should be clearly indicated by the Central Board of Forestry, keeping in view the principle of proper land-use, the nature of the terrain and the national needs. Deforestation may be allowed for the extension of permanent agriculture only where the area under forests is above this proportion or where some equivalent area can be afforested ; and
- (2) the area under forests should be steadily extended over waste lands considered suitable for the purpose.

4. The extension of the area under regular forests would necessarily constitute a long-term plan. Considerable improvement can, however, be brought about by renovating large areas which, though classified as forests, have been deforested or have not been properly managed. For instance, about 40 million acres of zamindari forests have vested or will soon vest in State Governments on the abolition of zamindari and jagirdari. Over a considerable portion of this area large scale removal of trees has occurred in recent years as a result of zamindars' attempts to realise their forest assets. Further, overfelling of trees occurred in State forests during the last war. During 1945-46 production of timber and fuel wood increased by about 62% over the pre-war triennium. The rehabilitation and development of these forests should be given the first priority. In most Part B and Part C States, as well as in Part A States where merger has expanded the State-managed forest area, an adequate administrative organisation has to be built up. Provision has been made in the Plan for increasing the number of forest circles in U. P., Bihar, Madhya Pradesh and Bombay ; and we consider that generally this five year period will be best utilised in planning the rehabilitation of these areas and setting up an adequate administrative machinery.

5. There is, however, immediate scope for extending the area under forests in three directions, namely—

- (1) afforestation as a measure to prevent soil erosion ;
- (2) extension of tree lands ; and
- (3) establishment of village plantations.

We have elsewhere outlined measures for preventing soil erosion. The area under tree lands could be immediately extended with the co-operation of the public and of local bodies. The co-operation of the public should also be sought in planting trees along canal banks, village roads and railway lines. Useful work in this direction has been initiated as a part of the Van Mahotsava programme which should be organised on a systematic basis.

VILLAGE PLANTATIONS

6. There is also immediate scope for the establishment of village plantations for increasing the supply of fuel and fodder. The present production of fuel wood is estimated at 5 million tons* which means an availability of less than half a maund (0.02 tons) *per capita per annum* as against an average consumption of a ton or more in U.S.A. and 0.34 tons for the world as a whole. Even this availability is by no means uniform as will be seen from Appendix II. The Indo-Gangetic Plain has been almost denuded of forests which has caused acute scarcity of fuel and fodder supplies in the rural areas and has resulted in the practice of burning cow-dung which should go to replenish the fertility of the exhausted soil. We, therefore, accord a high priority to protecting and extending village plantations of fuel and fodder species over suitable waste lands in selected localities. Large areas of waste lands have already vested in State Governments as a result of the abolition of zamindari and this should make the task less difficult. The survey referred to in paragraph 3 would serve to locate these areas and village panchayats or their unions should play an important role in the establishment of village plantations. The village plantations may, in the first instance, be set up in areas selected for Community Development Projects. Provision for the establishment of nurseries is being made in areas selected for these projects and this could be enlarged to meet the requirements of village plantations where necessary.

SOFT COKE AS HOUSEHOLD FUEL

7. Another step towards augmenting fuel supplies and conserving cow dung for manurial purposes would be the popularisation of the use of soft coke in the rural areas, particularly in the Indo-Gangetic plains where the need is the highest and where owing to the proximity of the coal fields the supply of soft coke may be comparatively easy. Soft coke being perhaps the cheapest form of fuel is becoming increasingly popular as a household fuel in urban areas. Despatches of soft coke have increased steadily as follows :—

1920	.	.	.	.	.	.	1.8 lakh tons.
1930	.	.	.	.	.	.	7.4 lakh tons.
1940	.	.	.	.	.	.	9.4 lakh tons.
1950	.	.	.	.	.	.	11.5 lakh tons.

The total consumption of soft coke is estimated at about 2 million tons. Very little of it, however, is consumed in the rural areas. India's deposits of low grade coal from which soft coke is prepared are fairly large. Increased manufacture of soft coke can, therefore, be easily organised in the Bihar and Bengal collieries. The real bottleneck will be transport. In view of the increasing pressure on the railway system we would set as a target that an additional 1 million tons of soft coke should be sold for consumption in the rural areas. Its sale in rural areas should be organised through recognised agencies on a no-profit-no-loss basis.

*The estimate of five million tons does not, however, include the quantities of firewood derived from wooded waste lands not classified as forests. The availability may therefore be somewhat larger.

8. The Soft Coke Cess Committee, which was intended to popularise the use of soft coke, ceased to operate during the war as increased supply of coke became difficult owing to the demands of the war effort on the rail transport system. The Planning Commission is examining the suggestion that the Soft Coke Cess Committee should be revived for the purposes of demonstrating in the rural areas the use of soft coke and its economies. A small cess on the sale of soft coke may be necessary to provide adequate finances for the Committee.

PRODUCTION AND REQUIREMENTS OF TIMBER

9. The production of timber recorded a large-scale increase during the forties. This occurred mainly to meet war requirements and resulted in considerable over-felling of trees and destruction of forests. Production has since declined and is at present in the neighbourhood of 1·8 million tons per annum. Including imports the total quantity of timber available is about 2·10 million tons. This consists of 0·69 million tons of soft wood and 1·4 million tons of hard wood. Although as a result of partition some valuable species have been lost, the principal forest areas are still included in the Indian Union.

10. The present consumption of timber is classified as follows :—

	(In thousand tons of round logs)
(a) Government consumption—	
Railway sleepers	340
Other railway demands	80
Defence and other Civil Departments	160
TOTAL	580
(b) Manufacturing industries—	
Match industry	120
Packing case industry	75
Plywood industry	60
Tea chests	40
Robbins, battery separators, etc.	40
TOTAL	335
(c) Balance available for other industries and for domestic and building purposes	1195
GRAND TOTAL	2110

About 73 per cent of the total timber is thus utilised in the private sector and the offtake by the Government is about 27 per cent.

11. Since the war the demand for timber for defence purposes has decreased. On the other hand, the demand for domestic and building purposes has increased considerably as a result of increased urbanisation and the rehabilitation programme. Further, as the availability

of steel is far short of total requirements, a policy of conserving steel and replacing it by timber has become imperative and should be adopted in the following cases :

- (i) Treated timber should be used for telephone, telegraph and electric power lines as is done in most countries of Europe. The annual demand for poles and the means of meeting it in various parts of the country have to be worked out in consultation with the State Forests Departments. We understand that about 50 thousand poles could be obtained annually from the Andamans and 30 thousand poles from the Sunderbans and Mahanadi areas. The Communications Ministry should take steps to utilise these poles and the States should see that the poles are supplied according to specifications.
- (ii) The Central and State Public Works Department should explore the possibilities of greater use of treated timber in building construction and major and minor engineering structures.

With its growing population and large scale development programme, India is likely to experience scarcity of structural materials for a long time to come, and it is, therefore, necessary to effect the utmost economy in this regard. We, therefore, recommend that a National Structural Board should be established which should consider which results of research can be carried into practice and adopted in building construction and how structural materials can be rationalised and standardised so that there may be the greatest possible economy.

12. Adoption of the measures outlined above will result in increased demand for timber. It has already been indicated that exploitable forests, particularly State-owned forests, have been over-exploited during the war. Greater production of timber would generally have to be obtained either from increased yields per acre or through development of potentially exploitable forests (about 20 million acres), which have not yet been exploited for lack of communications. The State Plans provide Rs. 104 lakhs for development of forest communications. It is necessary that schemes for utilising the inaccessible forest areas should be worked out in detail by a committee of experienced forest officers.

13. These are, however, essentially long term measures and the availability of timber is required to be stepped up immediately. This can be done to a considerable degree if besides the conventional species, substitutes like 'salai' and other perishable species are utilised after proper seasoning and treatment by suitable chemical methods, if necessary. The establishment of seasoning kilns and treatment units should, therefore, receive a high priority and it is suggested that

- (1) Seasoning kilns and treatment units should be installed in every government saw mill ;
- (2) The Railways should increase the number of their seasoning kilns and treatment plants to cover their entire requirements of timber ; and
- (3) The D.G.S.D. should give preference to suppliers of wood who have their own seasoning kilns and treatment units.

Further, most species of timber are liable to deterioration through fungal decay or insect attacks, especially when the timber is green and the weather is humid and hot. Large scale wastage occurs on this account due to delay in transport and want of proper storage arrangements in forests and sale depots. These losses can be greatly minimised by the adoption of prophylactic measures giving temporary protection. Similarly the use of treated fence poles by the Defence and Forest Departments would lead to reduced wastage and consequent economy.

14. It is expected that as a result of these measures the availability of timber would be raised by a lakh of tons by 1955-56. Another lakh of tons may be obtained by developing the North Andamans. About 50 thousand tons may also be obtained from the systematic exploitation of the private forests which, as a result of the abolition of zamindari, will vest in the State Governments. The total availability of timber by the end of 1955-56 would thus increase by about 2 to 2.5 lakh tons or by about 10 per cent without increased pressure on exploitable forests.

FOREST INDUSTRIES AND MINOR FOREST PRODUCE

15. Besides supplying timber and fuel, the forests are an important source of raw materials for the matchwood, plywood and paper industries and also potentially for the rayon industry. We have described elsewhere the programme for the development of these industries. The present requirements of timber for the matchwood industry are estimated at about 1,40,000 tons. The Andamans are supplying the needs of the match industry at Calcutta and to a limited extent at Madras and Bombay. The supplies from the Andamans will be increased by about 45,000 tons by 1955-56, which should meet the requirements of the expansion of the match industry during the period of the Plan. As regards plywood timber, the present production is estimated at about 60,000 tons. The supplies from the Andamans may go up by about 30,000 tons. Another 20,000 tons may be found by either substituting timber like mango or arranging imports. The total availability of plywood timber will not, therefore, exceed 1,10,000 tons in 1955-56. This sets the limit to the expansion programme for the plywood industry.

16. Bamboo is the principal forest produce used in the manufacture of paper. Other forest products used for paper manufacture are *Sabai grass* in U. P. and East Punjab and *Boswalia Serreta* (*Andukwood*) in Madhya Pradesh. With the partition of Bengal, the supplies of bamboo from East Pakistan have been mostly cut off and the paper industry in West Bengal has to depend mainly on Orissa forests for the supply of bamboos. Their annual requirements are estimated at about 75,000 tons, while the yield of bamboos from the Orissa forests is estimated at about 2,35,000 tons after making allowance for the needs of the local population. The extraction of bamboos from inaccessible areas involves a considerable outlay of capital on equipment, overheads and the construction of roads and paths. Long-term leases by the Orissa Government directly to the paper mills should facilitate the development of the unworked areas and the expansion of the paper industry at the mouth of the Mahanadi.

17. India is wholly dependent for its supplies of newsprint and pulp for staple fibre and rayon on imports from abroad. Large quantity of fir logs are available from the Himalayan region which could be utilised for the manufacture of mechanical and chemical pulp for the newsprint and staple fibre and rayon industries. Their annual supplies are estimated at about 1,80,000 tons. We have described elsewhere the feasibility of establishing a project for the manufacture of pulp, which should receive urgent attention.

18. The Forests also yield such minor products as lac, tanning materials, gums and resins, drugs, etc., the annual value of which is estimated at about Rs. 303 lakhs. Two of the minor products, namely, lac and myrobalans occupy a position of considerable importance in our export trade. During 1950-51 seed lac, stick lac and shellac worth Rs. 11.87 crores were exported. Internal production of lac could be increased almost indefinitely and should be intensified. Synthetic resins, though costlier, have come into use recently and are replacing lac for electrical insulations. India has almost a monopoly in shellac and it is of considerable importance to this country that shellac should not lose ground to synthetic resins. There have been complaints about adulteration and it is necessary to adopt standardisation of contracts and grading of all exports. India also exported myrobalans and their products valued at Rs. 1.32 crores during 1950-51. There is scope for the expansion of these exports provided collection can be intensified and grading done. Provision has been made elsewhere in the Plan for introducing grading of forest produce.

19. Cane has importance for internal consumption. Indian cane is generally considered less durable than Singapore cane. It would be worthwhile to get seed and cuttings of the varieties grown in Malaya and try them in India. We understand that the durability of the Singapore cane is due to some processing which might be tried in India.

GRAZING LANDS

20. Grazing in State forests yields about Rs. 95 lakhs of revenue annually. More important still, it provides fodder for about 13 million cattle, 3 million buffaloes and 9 million other animals and thus plays a vital role in the agricultural economy. On this subject the Forest Policy Resolution says :—

“Cheap forest grazing has a demoralising effect and leads to the vicious spiral of reckless increase in the number of cattle, inadequate forest grazing, reduced quality of the herds and further increase in their numbers to offset the fall in quality. Free and indiscriminate forest grazing is, therefore, a serious disservice to cattle breeding... Grazing should not be looked upon primarily as a source of revenue but the simple and obvious way of regulating and controlling grazing as also improving the quality both of grazing and cattle themselves is to institute a reasonable fee for the privilege of grazing.”

We are in general agreement with this policy. We would, however, suggest that cultivators and other residents in the rural areas may be allowed to graze their cattle to the extent of their requirements for agricultural purposes or for domestic milk consumption free of charge and all animals maintained over and above these requirements should be treated as part of a commercial enterprise and a fee for grazing at rates bearing a reasonable relation to the value of cattle produce should be levied.

21. There are considerable grazing lands still available in the areas under ryotwari settlements, usually known as village commons. These lands have for long been neglected and are subject to continuous soil erosion. Where suitable local agencies exist or can be created to undertake their management, rotational grazing should be introduced and these agencies assisted in the erection of enclosures. Where management of these areas by local bodies is not found feasible it may be better either to put them under village plantations or under cultivation rather than allow them to suffer further erosion and thus endanger cultivation in neighbouring cultivated areas.

FOREST ADMINISTRATION

22. Although forests fall within the State Governments' sphere, in view of the important place of forest products in the national economy and for national defence it is necessary that the forest policies of State Governments in respect of development and conservation should be co-ordinated. At present, though the Inspector-General of Forests at the centre along with his staff is expected to discharge this function, he is not in a position to do so as the working plans of the States and subsequent deviations therefrom are not referred to him. We understand that in the past this was invariably done, but later it was given up. In our opinion, some measure of centralised co-ordination of working plans of the States is necessary. We recommend two measures. Firstly, the summary of the State Governments' prescriptions of working plans should be forwarded to the Inspector-General of Forests for scrutiny and comments. Secondly, periodical inter-state conferences should be organised on a regional basis to enable the forest officers of the State Governments responsible for the working plans in States to discuss their working plans and exchange ideas on technical matters. Adoption of these measures will promote the co-ordinated development of the forest resources of India.

FORESTS RESEARCH AND EDUCATION

23. Very valuable work has been done in research on forests and forest products at the Forest Research Institute, Dehra Dun. Besides evolving methods for preserving timber and bamboos from attacks of pests and diseases, the Institute has played an important role in the establishment of industries for the production of paper, plywood, resin and turpentine, catechu, santonin from artemisia, ephedrin from ephedra, tamarind seed powder, rosa grass oil and several other commodities. There is, however, a considerable time lag between the research and its application. It appears necessary that a proper documentation office should be organised

for putting the results of research in a form in which the public can understand them and that a closer liaison should be established between the Institute and industries.

24. The three institutions where forest officers and forest rangers are trained are the Indian Forest College, Dehra Dun, the Indian Forest Rangers College, Dehra Dun and the Madras Forest College, Coimbatore. Their average annual output is 35, 70 and 35 respectively. As stated earlier, a large area of private forests has vested in State Governments and for their proper management the need for trained staff will be greater. The Inspector-General of Forests should ascertain the requirements of all States over the next few years and make arrangements for the training of the required staff at these institutions. The need for a separate research centre in the South, which has special problems of its own, has long been felt and should receive attention.

FOREST TRIBES

25. Various tribes inhabit forest areas. Measures for their welfare form part of the programme for the advancement of the backward classes, described elsewhere, for which the Plan provides Rs. 28.9 crores. The bulk of the forest produce is collected through contractors who tend to exploit the tribesmen. Useful work has been done in Bombay in organising co-operatives of forest tribes to replace contractors. The number of such societies increased from 11 in 1947-48 to 58 in 1949-50. The value of forest produce handled by the co-operatives during 1949-50 rose to Rs. 17.94 lakhs. It should be the object of State policy throughout India to organise the tribes into co-operatives for the collection of forest produce, and for this a phased programme should be drawn up. Responsibility for organising them into co-operatives should be laid on the forest departments which should have co-operative staff on their establishments.

26. The shifting cultivation practised by some of the tribes has caused heavy damage to many forests. To wean them away from this practice will take time and will not be easy. Gradually they have to be attracted to a settled and more intensive form of agriculture by providing them with opportunities for it and persuading them of its advantages. In some places it may be possible to settle them on cultivable land well away from the forests. In others it will be necessary to instruct them in the art of terraced cultivation and show them that more can be derived from the intensive cultivation of a few permanent fields in well-chosen localities where the slope is not too great than from periodic clearing and sowing of a whole mountain side. In some of the areas inhabited by these tribes fruit is grown by them on a small scale and with the improvement of communications and the introduction of better varieties this can be considerably developed. Generally speaking, the improvement of communications by opening up markets for agricultural and horticultural produce, will be a strong inducement to the tribes to abandon the wasteful system of shifting cultivation and take to settled agriculture.

THE PROGRAMME

27. The considerations on which the programme for the development of forests should be based have been outlined in the foregoing paragraphs. Priorities for particular items in any programme of development of forests may vary from region to region. In general these would be :

- (1) strengthening the forest administration where large territories have been merged or private forests have been transferred to public ownership as a result of abolishing zamindari and jagirdari ;
- (2) renovation of the areas which were over-exploited to meet war requirements ;
- (3) afforestation where large scale soil erosion has occurred ;
- (4) development of forest communications ;
- (5) development of village plantations to ease the fuel supply position ; and
- (6) stepping up supplies of timber by increased use of non-conventional species after proper seasoning and treatment by chemical methods and, therefore, increasing the number of seasoning kilns and treatment units.

28. Based on these priorities the State plans provided for the following expenditure in addition to Rs. 2 crores for Central schemes :

	(Rs. in lakhs)
1. Forest development	621.3
2. Administration	249.4
3. Forest industries	49.5
4. Education and training	39.3
5. Research	10.0
TOTAL	969.5

Forest development schemes include provision for the management and development of private forests and the waste lands vesting in State Governments besides Rs. 39 lakhs for soil conservation*, 29 lakhs for village plantations and Rs. 104 lakhs for development of communications.

*A further lump-sum provision of rupees two crores has been made in the Plan for soil conservation. The agriculture programme also includes some schemes of soil conservation.

APPENDIX I

Statement Showing Area Under Forests in Different Forest Regions of India (1949-50)

Region/State	Total geographical area (000 acres)	Area under forests (000 acres)	Percentage of colm. 3 to colm. 2
I	2	3	4
<i>Eastern Region—</i>			
Assam	54,408	13,339	24.52
Bihar	45,011	9,043	20.09
Orissa	38,487	2,913	7.57
West Bengal	19,696	4,062	20.62
Manipur	5,522	1,440	26.08
Tripura	2,580	2,213	85.78
Andaman & Nicobar	2,058	1,600	77.74
TOTAL	167,762	34,610	20.63
<i>North Western Regions—</i>			
Punjab	23,922	2,943	12.30
Uttar Pradesh	72,597	8,115	11.18
Jammu and Kashmir	59,379*	7,077	11.92
PEPSU	6,431	182	2.83
Rajasthan	83,332	8,180	9.82
Saurashtra	13,655	592	4.33
Ajmer	1,547	380	24.56
Bilaspur	290	128	44.14
Delhi	370		..
Kutch	10,864	127	1.17
Himachal Pradesh	6,692	2,150	32.13
TOTAL	279,069	29,874	10.70
<i>Central Region—</i>			
Madhya Pradesh	83,375	26,181	31.40
Madhya Bharat	29,785	7,138	23.97
Bhopal	4,402	1,436	32.62
Vindhya Pradesh	15,104	4,937	32.69
TOTAL	132,666	39,692	29.92
<i>Southern Region—</i>			
Bombay	71,213	13,097	18.39
Madras	81,786	18,442	22.55
Hyderabad	52,572	6,287	11.96
Mysore	18,873	3,010	15.96
Travancore-Cochin	5,852	1,953	33.37
Coorg ¹	1,015	740	72.91
TOTAL	231,311	43,529	18.82
INDIAN UNION	810,809	147,705	18.22

*Includes enemy occupied area.

THE FIRST FIVE YEAR PLAN

APPENDIX II

Production and Availability of Fuel

(1947-48)

State	Production (000 tons)	Availability <i>per capita per</i> annum (in lbs.)
Assam	148	34.8
Bihar	114	6.4
Bombay	985	6.2
Madhya Pradesh	1061	112.3
Madras	690	27.5
Orissa	96	14.7
Punjab	335	59.4
Uttar Pradesh	1129	40.4
West Bengal	302	27.6
Hyderabad	107	13.1
Jammu & Kashmir	179	91.7
Mysore	308	77.5
Pepsu	5	3.2
Rajasthan	N.A.	—
Saurashtra	36	19.9
Travancore-Cochin	131	32.3
Ajmer	6	19.7
Bhopal	10	26.9
Bilaspur	N.A.	
Coorg	7	70.3
Himachal Pradesh	16	36.4
Kutch	N.A.	
Tripura	2	7.0
Vindhya Pradesh	8	5.0
The Andaman & Nicobar Islands	2	144.5
TOTAL	5677	35.6

Source : Indian Forest Statistics 1947-48. Conversion from cubic feet to tons has been done on the basis of 50 cubic feet to a ton.

N.A. : Not available.

CHAPTER XXII

SOIL CONSERVATION

SOIL CONSERVATION in its widest sense includes not only control over erosion but all those measures like correction of soil defects, application of manures and fertilisers, proper crop rotations, irrigation, drainage etc. which aim at maintaining the productivity of the soil at a high level. In this sense, soil conservation is closely allied to improvement of land use in general. In this chapter, however, we are concerned only with the measures for control over soil erosion, which is one of the most serious problems facing the country. Large areas in all parts of the country have been rendered useless as a result of soil erosion and areas which suffer from moderate or slight erosion and whose productivity is reduced as a result of soil losses are very much larger still. Sheet erosion, which consists in the washing away of the fertile top layers of the soil, is the most extensive form of erosion, occurring even on moderately sloping lands. It causes enormous losses to agriculture every year by reducing the productive capacity of lands. Gully erosion, which generally starts after sheet erosion has remained unchecked for some time, has already rendered large areas useless, and is steadily increasing. In the dry western part of the country, erosion as a result of wind action and covering of croplands by desert sands along the margins of the Rajasthan Desert constitute serious problems.

2. The most important cause of erosion is destruction of forests and other vegetation from sloping lands, desert margins and other areas susceptible to erosion. Vegetation acts as a protective cover against the forces of wind and water, protecting the soil from being washed or blown away and preserving the physical and hydrographic balance of nature. Forests for instance, provide the most effective protection against erosion on hill slopes. They break the force of run-off by impeding the flow of rain-water down the slopes and by absorbing large quantities of it in their dense mat of undergrowth. This absorbed water flows away slowly over a period of time; a large part goes into the soil, flows under-grounds, feeds springs and streams and is available for utilisation in the foothills and plains. In this way, the hill slopes are protected from erosion, the flow of streams is regulated, the danger of floods is reduced and sufficient quantities of water are available in dry periods. But, when the protective cover of forests is destroyed, this natural balance is disturbed. Rain-water flows down the slopes unimpeded at great speed and carries with it large quantities of soil and other loose material. The hill slopes are denuded of valuable soil and lands in the foothill zone where this unassorted mass of sands and gravels is deposited are in turn rendered unproductive. Most of the water flows away during the rainy periods with the result that on the one hand floods are more frequent and more severe and, on the other, little water is available during the dry periods. Ground-water supplies are also reduced as much less water is absorbed in the soil than before.

Destruction of trees and natural grasses in dry areas has similar harmful effects. Trees act as wind-breaks, reducing the force of the wind, and the grasses bind the sandy soils. But

when such protective vegetation is destroyed, the sandy soils, exposed to the full force of the wind, begin to be blown away. Large areas in the marginal zones of deserts are thus rendered unproductive by the deposition of sand. It is believed that many deserts of the world (including the Thar Desert of India) have increased in area in historical times by this process.

3. The causes of destruction of forests and soil erosion, and the nature and severity of the erosion problem vary greatly in different parts of the country. In some areas as in the forests of Assam, Bihar, Orissa and Madhya Pradesh, shifting cultivation, which is practised by the tribal people living in these areas, is a major cause of the destruction of forests. Unregulated grazing is the cause of the destruction of forests and consequent soil erosion over large areas in all parts of the country. In the north-western Himalayas, for instance, grazing by cattle, sheep and goats is the most important cause of depletion of the vegetation cover and soil erosion. Similarly, over large parts of peninsular India, the destruction of forests and soil erosion are due mainly to over-grazing. Intensive felling to obtain supplies of fuel or timber, and clearance of forests for extension of cultivation under the pressure of demand for agricultural land from the increasing population are other important causes of deforestation and soil erosion.

Besides the damage caused as a result of the destruction of forests, considerable erosion results from faulty land use practices on farmlands themselves. Failure to practise such measures as ploughing along the contours on sloping lands, proper crop rotations and in particular growing of cover crops are causes of erosion over large areas. Much damage originates also in fallows, grazing lands or uncultivated waste lands which are generally neglected.

4. Measures for controlling erosion and restoring the productivity of eroded lands can be divided into four classes:

- (1) *Regulation of land use.*—This includes all measures for securing such alterations in the existing patterns of land use as are necessary to ensure that the different types of lands are used according to their land use capability *i.e.* the use for which, in view of their physical characteristics, they are best fitted. Retiring cultivated lands in highly erodible areas from cultivation and bringing them under forests or grazing ; restrictions on or closure of grazing in badly eroded forests or grazing lands, and settlement of shifting cultivators to permanent cultivation are some examples of the types of alterations which are needed.
- (2) Afforestation and preservation of forests by scientific forest management.
- (3) Improvement of land use practices on farm lands. This includes such measures as ploughing along the contours and strip-cropping on sloping lands ; proper crop rotations ; application of adequate manures and fertilisers ; care of fallows and other uncultivated lands.
- (4) *Engineering measures.*—Under this are included construction of bunds and terraces, check dams, channels for drainage of surplus water, gully plugging, etc.

A comprehensive programme of soil conservation for an area would include all four types of measures, although the relative importance of the different measures would vary greatly in different areas depending upon the particular conditions of the area.

5. As a large part of the soil conservation work has to be done by the farmers, proper understanding on their part of the nature of the erosion problem, and their active participation in soil conservation programmes are essential for the success of these programmes. Improvements in farming practices depend entirely upon the farmers. Government's function is mainly one of convincing them of the need for such improvements and demonstrating the correct methods of adopting them. Financial assistance, in the shape of supplies at reduced rates or in other forms may also be given. Engineering measures have to be taken mostly on the farmers' fields. These may be taken by the farmers, individually or in co-operation, with technical or financial assistance from the Government; or the work may be done by Government and the cost (or a part thereof) recovered from the farmers. Finally, restrictions on usage in forests can be really effective only if the farmers, graziers and other users of forests understand the importance of these and feel that they are essential in their own long-term interest, besides being vital for the welfare of large populations in the plains. Education for soil conservation, publicity and demonstration aimed at creating among the general public and especially among the farmers an awareness of the erosion problem, its causes and effects, and what they can do to control it must form a very important part of soil conservation programmes. Formation of associations of farmers for soil conservation work has also been proposed in order to provide a suitable medium through which soil conservation measures can be taken on a co-operative basis at the village level.

6. Steps for the control of erosion and conservation of soil have been taken for a number of years in certain States like the Punjab (afforestation in the Sivalik Hills) and Bombay (bund-ing and terracing work in the Deccan). More recently, soil conservation work has been taken up in several other States also. But there has been no country-wide effort in this direction so far, and even in States where the work has been going on, this has been on a very limited scale. The programme for soil conservation in the Plan, though small in comparison with the magnitude of the problem, marks the beginning of a country-wide effort to tackle it. There are many limitations to undertaking a larger programme at this stage. Very little work has been done on soil conservation so far ; data on such basic items as soil characteristics and type and severity of erosion in different parts of the country is lacking, and technical personnel with the necessary training and experience is limited and has to be drawn from many different fields. These limitations will be largely overcome during the period of the Plan. The necessary administrative machinery will be set up at the Central and State levels; survey and research organisations will be established and essential data collected ; suitable legislation enacted, and a much greater consciousness of the erosion problem will be created. As a result, it will be possible to take up a more adequate programme in subsequent years.

7. Programmes for soil conservation and improvement of land use during the period of the Plan should be worked out for each State by its Land Utilisation and Soil Conservation Board, the formation of which we are recommending (*vide* para. 19). These programmes should be based on an assessment of the erosion problem in the State. Such an assessment can best

be made by a rapid survey of the reconnaissance type by which the major erosion affected areas are demarcated and the types and degree of erosion in each area broadly indicated. One or more areas of suitable size should be selected for work during the period of the Plan. Preference should be given in making this selection to areas which are representative of much larger regions suffering from erosion so that the experience gained in these would be applicable to the larger areas. In States where soil conservation work is already going on, the possibility of extending the scope of this work should be carefully examined. The State Plans would be reviewed and approved by the Central Land Utilisation and Soil Conservation Organisation. Assistance from the experts of the Central Organisation may be obtained by States which may need them in drawing up these programmes or subsequently in their execution. A sum of Rs. 2 Crores has been provided by the Central Government for soil conservation work during the period of the Plan*. Out of this, allocations will be made to finance approved soil conservation programmes of States.

SOIL CONSERVATION ASSOCIATIONS

8. As much of the soil conservation work has to be done by the farmers themselves, constitution of co-operative associations of farmers for soil conservation work would be most useful. Such associations should be constituted by law after a specified proportion of the farmers in an area decide upon their establishment. All the farmers in the area covered by such associations would then be required to make such improvements in their farming practices and on their fields as may be specified by the association. The establishment of such associations is especially necessary in such areas as the catchments of small streams and nullahs, in case of which soil conservation programmes can be successful only with the co-operation of all the farmers in the area. These associations should be given preference in the matter of technical guidance and financial help for approved soil conservation programmes. In the United States, considerable success has been achieved by organisation of farmers into Soil Conservation Districts for carrying out soil conservation programmes. This experience should be drawn upon for the constitution of these associations. The Central Land Utilisation and Soil Conservation Organisation should prepare a model law for the constitution of such associations which can be adopted by the States with suitable modifications to suit their particular needs. Encouraging the formation of such associations should be one of the main functions of the State Land Utilisation and Soil Conservation Boards.

LEGISLATION

9. Suitable legislation for soil conservation should be undertaken by the States. In the main legislation should provide for:

- (i) Powers to execute specified improvements on the farmers' fields and allocation of the costs of these improvements between farmers and the State.
- (ii) Constitution of co-operative associations of farmers for soil conservation work.

* This sum is in addition to the expenditure on soil conservation and land improvement measures provided for in the Plans of several States

- (iii) Powers to restrict usage practices in certain areas, which may be declared "protection areas" *i.e.*, areas in which restriction of such practices is necessary for protection of much larger areas from erosion, floods, silting and desiccation.

RESEARCH AND DEMONSTRATION

10. The Plan provides for the establishment of a Soil Conservation Branch at the Forest Research Institute, Dehra Dun, at which research on various problems connected with soil conservation will be undertaken. In addition, six research and demonstration centres will be established in different parts of the country*. Each of these centres will be located in an area of wide-spread erosion, and one which has been chosen for a soil conservation programme during the period of the Plan. Each centre will serve as a pilot station (or laboratory) for the programmes in its respective area and the site for the centre will be selected with this end in view. Data on soils, land-use, rainfall, run-off, soil-wash under different conditions, and effectiveness of various types of vegetation cover in arresting soil erosion will be collected at these centres. They will also serve as centres for demonstration of improved land-use and soil conservation practices to cultivators in their respective areas.

SOIL AND LAND UTILISATION SURVEY

11. For the execution of a long term programme of soil conservation as also for the wider objects of improving land use and increasing crop yields, a soil and land utilisation survey of the country is most essential. Lack of such a survey is one of the major handicaps in the improvement of agriculture. Data on soils and utilisation has been collected by Irrigation Departments of various States, by agricultural experiment stations, universities and other institutions. But such data is confined to limited areas scattered in different parts of the country, and as different agencies have employed different techniques of classification and survey, the data is not comparable. An all India survey of soils and land utilisation should be instituted. Through this survey, data on soil characteristics and the present position regarding land use in different parts of the country should be collected and lands classified according to their land use capability (*i.e.*, the use for which the lands are best fitted). The survey should be carried out by a central agency so that there is uniformity in the system of classification and in surveying and mapping techniques and scientific nomenclature, and the results from different areas may be comparable. Programmes of soil survey and testing of soils which are being carried out at present by the Indian Agricultural Research Institute and by other agencies should be co-ordinated with the work of the survey.

SOIL CONSERVATION IN COMMUNITY DEVELOPMENT PROJECTS

12. Improvements in land-use and agricultural practices form the major part of the work in the community projects areas. While the main emphasis in these projects has necessarily to be on increasing agricultural production, adequate steps should also be taken for the control of erosion and conservation of soil and water, wherever these are necessary. In case of projects located in the plains, erosion may not be a problem except in limited areas and soil conservation.

*NOTE : The Desert Research Station at Jodhpur will be in addition to these.

measures may be necessary only for these. But in projects located in hilly regions, soil conservation measures should form an important part of the development programme. Large areas suffer from erosion in hilly regions and no permanent improvement is possible if the fertile soil of such large areas is continuously washed away by erosion. Similarly in the case of projects located in the desert and semi-desert areas (as in Rajasthan) afforestation and creation of vegetation belts composed of trees and soil binding grasses must form an important part of the programme. Instructions in soil conservation measures should be given to village level workers and to the other project staff, especially those who have to work in hilly or dry areas. Certain States may also find it suitable to select one or more of the community project areas for their soil conservation programmes during the period of the Plan.

SOIL CONSERVATION IN RIVER VALLEY PROJECT AREAS

13. A programme of soil conservation should be taken up in the catchment area of every river valley project. Adequate steps for soil conservation in catchment areas are as essential to the proper development of water resources as construction of dams and reservoirs on the rivers. If these measures are not taken and erosion goes on unchecked, the catchment areas will be reduced in their productivity. The high silt loads resulting from erosion will increase cost of operation, impair efficiency, and reduce the life of dams and reservoirs. The danger of damage to dams and other structures by sudden and violent floods will also be greatly increased. Measures for control of erosion and improvement of land-use should, therefore, form an integral part of the work in every river valley project. In the case of certain catchments like that of the Kosi, in which the rate of silting is known to be very high, adequate soil conservation measures are a prerequisite to the undertaking of the project itself.

14. Surveys of soil erosion and land-use capability should be undertaken in the catchment areas and detailed plans for soil conservation should be drawn up on the basis of these surveys. Critical areas should be demarcated and a programme of preservation of forests and other natural vegetation by regulation of grazing and felling, protection from fires, control over cultivation especially shifting cultivation, should be undertaken. Afforestation and other erosion control measures like gully plugging, construction of bunds and terraces should be taken up in suitable areas. Cultivators should be taught conservation practices and should be given technical and financial assistance for adopting them. The cultivators of each sub-catchment should be encouraged to form themselves into soil conservation associations and formulate a conservation programme with the sub-catchment as the unit. Approved conservation programmes of such associations should receive preference in respect of technical and financial assistance from the Government.

15. The adoption of conservation measures will generally involve curtailment of the customary rights of certain classes of persons like graziers and shifting cultivators. Such restrictions are, however, absolutely necessary in the interest of the entire population of the river valleys and should be strictly enforced. Suitable arrangements should, however, be made for resettling and providing alternative means of employment for the populations whose privileges or rights may have been restricted.

16. Most of the large rivers of the country pass through the territories of two or more States. In many cases, soil conservation measures are necessary in one State in which the catchment area of the river is located while areas receiving irrigation or flood control benefits are located in other States. Soil conservation measures in such cases can be effective only with the co-operative effort of all the States concerned, and if suitable arrangements are made for financial contribution towards the cost of these measures by States which would receive benefits from the projects. One of the principal functions of the Central Organisation which we are proposing would be to secure agreement among the various States concerned, and to see that a co-ordinated programme of soil conservation is adopted for every river valley project.

THE PROBLEM OF THE RAJASTHAN DESERT

17. Desert and semi-desert conditions prevail over a large area in western India—in Rajasthan and the adjoining areas of Punjab, Pepsu, U. P., Saurashtra and Kutch. The Planning Commission in its Draft Outline Report drew attention to the reported advance of the desert and encroachment of sand on fertile lands. The Government of India recently appointed an *ad hoc* Committee of experts to investigate this problem. The Committee has recommended a comprehensive programme of action which includes creation of a vegetation belt—five miles wide—along the western border of Rajasthan, afforestation measures so as to increase the proportion of forest area in Rajasthan; improvement of land-use practices, especially the creation of shelter belts of trees by cultivators, and establishment of a research station to investigate the problems of the desert. The report of the Committee has been considered by the Central Government. As a first step, a Desert Research Station is being set up at Jodhpur and a pilot scheme for the creation of vegetation belts and the improvement of land-use is being taken up. Research on soils, land-use and silvicultural practices will be undertaken at this station. The scope of research is proposed to be extended later to include detailed hydrological, meteorological, geological and geophysical investigations. The station would serve also as a centre for the demonstration of improved land-use techniques and the distribution of seeds and other supplies.

18. As a number of States are affected by the advance of the desert, and as successful tackling of the problem would depend in a large measure upon co-ordinated action by the various States concerned, the need for inter-State co-operation in this sphere cannot be over-emphasized. We recommend that a co-ordinated programme of action, indicating clearly the measures to be taken in each State should be jointly worked out by the various States concerned in consultation with representatives of the Central Organisation.

ORGANISATION

19. For carrying out the programmes outlined above and generally for the formulation and implementation of suitable policies in the fields of land utilisation and soil conservation, we recommend the constitution of: (a) a Central Land Utilisation and Soil Conservation Organisation at the Centre, and (b) a Land Utilisation and Soil Conservation Board in every State.

20. The Central Land Utilisation and Soil Conservation Organisation will have two parts :

(a) A Board in the Ministry of Agriculture which may consist of the following :—

Secretary to the Ministry	• Chairman.
Inspector-General of Forests	• Member.
Member (Irrigation), Central Water and Power Commission.	• Member.

The Board should have a full time Member-Secretary who should be a senior officer with experience of agriculture or forestry work.

(b) A council composed of representatives from the various States. This Council should meet once or twice each year to frame general policies.

The Board should have an adequate technical staff for carrying out the various functions of the organisation which would be as follows :—

- (i) Assessment of the soil erosion problem in the country on the basis of the reconnaissance survey which would be conducted.
- (ii) Framing a common policy for the control of erosion and for soil conservation in the country. The Board will scrutinize and review the States' plans for improvement of land-use and soil conservation. Officers of the Board may be loaned to State Governments which do not have the necessary staff of their own for assessment of the erosion problem, preparation of soil conservation plans, and, if necessary, also for their execution.
- (iii) Helping the States Governments in drafting suitable legislation for soil conservation purposes.
- (iv) Bringing together State Governments with a view to evolving agreed programmes of action on problems like soil conservation in river valley projects areas and checking the advance of the Rajasthan Desert where inter-state co-operation is necessary.
- (v) *Research and demonstration*—The soil Conservation Research Branch at the Forest Research Institute, Dehra Dun and the Desert Research Station at Jodhpur will be under the charge of the Organisation. The other soil conservation and demonstration centres will be managed jointly by the Central Organisation and the Board of the State in which they are located. The organisation may aid suitable research programmes at other institutions in India. It should also evaluate and publicise research on soil conservation, and secure adoption of results of such research in soil conservation programmes.
- (vi) *Survey*—The proposed Soil and Land Utilisation Survey will form part of the Organisation.
- (vii) *Publicity and Training*—The Organisation will have suitable programmes for publicity and for the training of personnel for soil conservation work.

21. A State Land Utilisation and Soil Conservation Board should be created in the Department of Agriculture or Forestry of every State. The composition of the Board may be as follows :—

Minister-in-charge of Agriculture or Forestry	•	Chairman.
Secretary, Development Department	•	Member.
Chief Conservator of Forests	•	Member.
Chief Engineer, Irrigation	•	Member.
Director of Agriculture	•	Member.
Head of the Revenue Department in the State	•	Member.

The Board should have a full time Member-Secretary who should be a senior officer with experience of agriculture or forest management work.

Other members may be appointed as necessary.

The Board should have adequate technical staff as well as field staff for the execution of its various programmes. The Member-Secretary of the Board will be the Director of such programmes and should be given a suitable status.

The functions of the Board will be :

- (i) Assessment of the soil erosion problem in the State. For this purpose a reconnaissance soil erosion survey should be carried out.
- (ii) Preparation of plans for control of erosion and soil conservation in the State.
- (iii) Drawing up suitable legislation for the execution of improvement of land-use and soil conservation programmes.
- (iv) Execution of plans, *e.g.*, construction of bunds, terraces and other works ; demonstration of soil conservation practices ; aid to cultivators for execution of approved soil conservation programmes, and promoting formation of soil conservation associations. Those of the measures which lie in the sphere of action of other Departments should be undertaken through the regular agencies of the Department concerned. Thus the necessary restrictions on grazing, felling etc. should be enforced by the Forest Department. The presence of representatives of the various Departments concerned on the Board will ensure the co-operation of these Departments.
- (v) Framing suitable programmes for demonstration and research, publicity and training of personnel.
- (vi) Supervision and control of Soil Conservation Associations.

CHAPTER XXIII

FISHERIES

FISHERIES IN India, though very under-developed, contribute annually about Rs. 10 crores to the national income. Rich in proteins, vitamins and mineral salts, fish is a valuable protective food. It forms an important constituent of the diet over considerable areas. The development of fisheries is, therefore, one of the most promising means of improving the diet of the people.

PRODUCTION TRENDS

2. The inadequacy and inaccuracy of the existing statistics for fisheries have been emphasized by several committees. The Report on the marketing of fish published by the Directorate of Marketing and Inspection is the principal source of information. Some useful data about the marine fisheries has been recently collected by the Central Marine Fisheries Research Station. The technical committee on the co-ordination of fisheries statistics has examined the question of statistics in detail. Its report was published in 1950 and we hope that with the implementation of its recommendations by the Central and State Governments the position will steadily improve. A sum of Rs. 8 lakhs has been provided in the Plan for the improvement of fisheries and livestock statistics.

3. Precise estimates of production of fish are difficult to obtain. The available evidence, however, shows that the present production is about a million tons, out of which about 70 per cent is sea and estuarine fish and 30 per cent fresh water fish. Madras, Travancore-Cochin and West Bengal are the three States which account for a major part of the production. As comparable figures of production for a sufficiently long period are not available, it is difficult to examine production trends. Information about the quantity of fish landed on the west coast of Madras since 1936-37 is available. The figures indicate :

- (i) wide variation in the catch from year to year ; and
- (ii) an increasing trend in production.

However, in the absence of comparable data for other areas, it cannot be concluded that production of sea fish as a whole shows an upward trend.

4. As regards fresh water fish no figures are available to show the trend of production. The stocking of more than 70,000 acres of water area under the Grow More Food schemes should have increased production. On the other hand, the opinion has been expressed that a progressive decline in the production of fresh water fish has taken place due to :—

- (a) the excessive growth of water hyacinth and submerged weeds in impounded waters ;

- (b) neglect of tanks, beels, etc. consequent on the development of major irrigation works ;
- (c) the silting of rivers, channels and beels ;
- (d) over-fishing and destruction of finger-lings and immature fish ; and
- (e) construction of dams and weirs over rivers which obstruct the migration of fish from and to their customary spawning grounds.

The measures required to promote the development of the inland fisheries are outlined in subsequent paragraphs. Here, it will suffice to emphasize the importance and urgency of adopting adequate measures.

5. At the present level of production the availability of fish for the country as a whole works out at 3.4 lbs. per annum per capita as against 16 lbs. in Ceylon, 70 lbs. in Burma and 90 lbs. in Japan. A considerable section of the population of India does not, however, eat fish. Allowing for this, the average per capita consumption is estimated at 4.94 lbs. Availability varies considerably from State to State. Travancore has the highest consumption of 21 lbs. per capita (about one ounce per day). Other States which consume considerable quantities of fish are West Bengal (13 lbs.), Madras (12 lbs.), Bombay (7 lbs.), Assam (6 lbs.) and Orissa (5 lbs.). Consumption is lowest in the Punjab (0.8 lbs.). The requirements of a balanced diet are estimated at 1.3 ounces per day per adult, *i.e.*, 30 lbs. per capita per annum of fish and/or meat. The availability of meat is poorer still. This indicates a large gap between availability and requirements.

SCOPE FOR DEVELOPMENT

6. The scope for increasing production of fresh water and sea fish is certainly large. In the case of inland fisheries statistics for the area developed so far are not available, but it is known that only a fraction of the water area of 15 million acres under rivers, canals, jhils and tanks has been utilised. No surveys have, however, been carried out to determine the extent of culturable waters. The back water and estuarine fisheries are still very largely under-developed. India's coast line is 2,900 miles long. Though it is not as well indented as the coasts of, say, England and Japan and has a rather narrow continental shelf, it offers considerable scope for the development of sea and estuarine fisheries. Only a small portion of the resources are being exploited at present mainly for two reasons, namely, (1) the small country craft cannot operate beyond a few miles from the shore and (2) over a large area adequate harbour and landing facilities do not exist. Recent charting and exploratory offshore fishing operations carried out in the Bay of Bengal and along the west coast indicate that our seas are rich in a variety of commercial species of fish which can be economically exploited.

INLAND FISHERIES

7. In order to draw up a phased programme for the development of the inland fisheries the first essential step would be to conduct a rapid survey so as to determine the culturable waters and simultaneously to investigate fish seed resources for undertaking large-scale stocking operations. It would also be necessary to classify culturable waters into (1) those that can be

utilised for fish culture without any expensive measures for their improvement and (2) derelict waters which would require a large capital outlay for improvement. For States which are at present deficit in fish seed resources, supplies would have to be arranged from surplus areas, where large-scale collection and distribution of fish seed would have to be organised. Large wastages occur in the transport of fingerlings and fry. Research work done at the Central Inland Fisheries Research Station at Barrackpore and the sub-station at Cuttack has demonstrated that mortality during transport and cultural operations can be greatly reduced. This work should be intensified. The bulk of the existing culturable water area consists of tanks and beels. Carp, which are the fish most frequently reared in Indian waters, do not spawn in impounded waters with the result that stocking operations in the same water have to be carried on year after year. If the artificial spawning of carp could be developed or alternatively such species of fish located as would spawn in impounded waters and would be otherwise suitable for stocking, the industry could be improved considerably. The artificial spawning of species of fish that do not normally breed in enclosed waters has been successfully achieved in Brazil, and in Indonesia common carp from Europe are made to spawn three to four times in a year by special methods. We recommend that a high priority should be attached to research in this direction.

8. Other necessary steps for the development of inland fisheries would be to prevent over fishing and the destruction of fry and fingerlings by adopting, where necessary, adequate legislative measures, to improve derelict tanks and beels and to demonstrate improved cultural practices. The inland fisheries are dispersed all over the country side and their development requires an extension organisation on a large scale. We do not however visualise a separate organisation for the purpose and suggest that fishery extension work should generally form part of the normal duties of the agricultural extension organisation and pisciculture should form part of agricultural education in agricultural schools and colleges. Some fisheries staff may, however, be necessary at State and other levels for giving technical guidance and training to the field staff. Arrangements exist at the Central Inland Fisheries Research Station for theoretical and practical instruction in modern piscicultural practices and this staff could be trained there.

9. The appearance of water hyacinth and other weeds in impounded waters has affected their productivity very seriously. Attempts at destruction of this weed have not yielded satisfactory results so far and further investigation and research appear necessary to evolve suitable mechanical devices and chemical weedicides for their destruction.

10. The existence of private rights in village tanks has often hampered the development of inland fisheries. These have largely disappeared as a result of the abolition of zamindaris and fishing rights in them now vest in State Governments. Their systematic management is, therefore, a responsibility of the State. This work would be very much facilitated by enlisting the co-operation of local bodies. We would recommend the acquisition of fishery rights in waters which do not vest in the State Governments if their owners fail to carry out the suggestions made by the State Fisheries Department. The West Bengal Government have already

enacted legislation to this effect. The Fisheries Department should also have facilities for developing fisheries in all State waters without necessarily taking over their management in other respects. We would also suggest that for developing fishing in the multipurpose projects and dealing with other problems arising therefrom the State Irrigation Departments should have staff for fisheries development, which should work under the technical guidance of the Fisheries Department.

11. The long coast line of India has numerous estuaries and brackish-water lakes and backwaters rich in fish. The brackish-water area is computed at about 1.9 million acres, and includes the Chilka lake covering about 256 thousand acres and yielding about 3,000 tons of fish annually. The bulk of the area vests in State Governments and is very largely undeveloped. Its development for fisheries involves large capital investment for the construction of suitable embankments and sluices. The stocking operations should not present much difficulty as fish seed is available locally. In Travancore-Cochin, a small area has been reclaimed and converted into productive fisheries. Similar undertakings should be organised in other States and areas settled in suitable blocks with co-operatives of fishermen.

MARINE FISHERIES

12. Efforts at development of marine fisheries should be directed towards—
1. mechanisation of country craft and introduction of new mechanised boats,
 2. introduction of mother-ship operations,
 3. charting for deep sea fishing and development of the located fishing grounds,
 4. provision of training facilities,
 5. creating adequate ground organisation,
 6. supply of requisites to fishermen, and
 7. efficient marketing.

The number of boats in operation is estimated at about 70,000. It has been indicated that the small country craft do not operate beyond a few miles from the shore and spend much of their time in going to and from the fishing grounds. Consequently production per unit of effort is low. Mechanisation of fishing operations would enable the fishermen to reach areas outside the range of the existing craft and also to fish for longer hours. The manner in which mechanisation can be accomplished is likely to vary from region to region. In some areas some of the indigenous craft may be found suitable for mechanisation through installation of small inboard or outboard engines; in other areas they could be brought into service on the basis of mother-ship operations. In still others it may be found more economical to introduce new types of small powered fishing craft, scientifically designed, and constructed but conforming to the traditional lines of the craft normally used. About 4,000 boats operate along the Bombay coast of which it is estimated that about a thousand would lend themselves to mechanisation. Some *machhwas*, *hodas* and *hodis* on the Saurashtra Coast can also perhaps be mechanised. The catamarans operating along the east coast which are

perhaps the cheapest and most efficient contrivance for landing fish on surf-beaten beaches, are not suitable for mechanisation. Although it is not possible to determine, without a proper survey, the total number of existing boats which could be mechanised, their number may not be very large. In Bombay useful pilot work has already been done in mechanising country craft and in Madras small mechanised vessels, not very different in design from the existing craft, have been introduced and are reported to be doing well. It may be useful to send parties of fishermen from other areas to see these boats for themselves. The Plan provides for mechanisation of 140 boats—100 in Bombay, 20 in Saurashtra and another 20 on the west coast of Madras. Provision has also been made for the introduction of fourteen 30—35 feet mechanised boats of multipurpose type. We would also recommend that the construction of new boats should be guided and supervised so that they may lend themselves to mechanisation subsequently.

14. There is also good scope for development of mother-ship operations on the west coast of India. These would require tugs equipped with refrigeration facilities and suitable for towing the types of craft at present operating along the coast. The Plan provides for two tugs as mother craft—one to be located off the Saurashtra Coast and the other at Cochin.

15. As in other countries, the large scale development of off-shore fisheries in India would require the introduction of larger types of powered fishing vessels such as purse seiners and trawlers. It is believed that purse seiners, which have not yet been tried in India, would be useful for catching mackerel, oil sardines and other shoaling fish which appear in Indian waters during certain months. We have, therefore, provided for two purse seiners, for experimental purposes, one to operate around Karwar, mostly for catching mackerel, and the other to be based at Cochin for catching oil sardines.

16. The Fisheries Department of the Government of India and of the West Bengal Government have done useful exploratory trawling in waters off Bombay and in the northern parts of the Bay of Bengal. They have located good fishing grounds and collected other useful data which indicate that our off-shore waters offer considerable scope for fishing. There are some other areas, such as Wadge Bank and Pedro Bank, which offer equally good prospects. The Ceylon and Madras Government trawlers have charted these areas and demonstrated that there are commercial possibilities. Possibly due to lack of proper ground organisation, *i.e.*, transport, landing and servicing facilities, refrigeration arrangements and marketing, Indian trawlers have not yet fully demonstrated the possibilities of commercial operations and the trade has not therefore, been attracted to undertake such operations. Since 1951, a Japanese trawler, Tayo Maru No. 17, has worked along the west coast. The catches obtained by this vessel during the last six months have been satisfactory. Even under severe monsoon conditions fairly good catches have been obtained. Provision has, therefore, been made in the Plan for a somewhat similar trawler for operations in the Arabian Sea. Bull trawling *i.e.*, operations by two small trawlers working together, as practiced in Japan, appears to offer good chances of success in Indian waters. If the Japanese technique and personnel, with experience of fishing in tropical waters, were made use of in these operations, it should be possible to obtain better results. We have, therefore, provided for 3 small trawlers for the West Bengal

Government for bull trawling. Provision has also been made in the Plan for renovating Government of India trawlers and fitting them with equipment for bull trawling in the Arabian Sea for which they are considered suitable. The Madras Government have also got eight motor fishing vessels which have recently been repaired for off-shore operations.

17. It is well known that fishing grounds carry a greater abundance of fish when virgin than after having been fished, and therefore the initial catches should not be regarded with excessive optimism. For trawling to be commercially successful it is necessary that there should be a sustained catch over a long period. A close analysis of the catch landed in ports is, therefore, essential to ensure that grounds are not depleted.

PERSONNEL AND TRAINING

18. The commercial success of trawling even though the grounds are well charted, will depend largely on the efficiency of the personnel employed. It is, therefore, important that immediate arrangements be made for the training of adequate Indian personnel. The Government of India have been alive to this and a batch of eight trainees is being given intensive training in modern fishing methods. It was also made one of the conditions of the licence granted to the Japanese Company that they would undertake the training of Indian crews. In the selection of the crews preference should be given to persons belonging to the fishing community. For a balanced and planned development of the Industry it is necessary to take the assistance of experts with considerable knowledge and experience of ground organisation and marketing, such as fisheries engineers, naval architects and harbour specialists. The Government of India are arranging to get the services of some of these experts through the F. A. O. and under the Point Four Programme. It is important that the experts arrive, so far as possible, simultaneously and work as a team. Provision has also been made in the Plan for obtaining the services of fishing technicians required for manning fishing vessels. Where boats are mechanised or new mechanised boats are introduced, arrangements for training fishermen in handling such boats would be necessary. A sum of rupees five lakhs has been earmarked for the purpose in the Plan.

GROUND ORGANISATION

19. As stated earlier the success of commercial fishing operations is very largely dependent on the efficiency of the ground organisation which should include landing and servicing facilities, refrigeration plants, quick transport arrangements and efficient marketing. Liaison with port authorities will be necessary for provision of landing facilities. Inadequate servicing facilities have meant plenty of waste of time in the past which should be remedied immediately by permanent long term arrangements. To avoid glut and scarcity conditions and prevent the considerable amount of spoilage which occurs at various stages, arrangements for ice and cold storage and quick transport facilities are necessary at the landing ports and

assembling and distribution centres. The Plan, therefore, provides for installation of nine ice factories and cold storage plants as follows :—

Madras (West Coast)	.	.	.	.	1 of 50 tons.
(East Coast)	.	.	.	.	2 of 50 tons each.
West Bengal	.	.	.	.	1 of 50 tons.
Bombay	.	.	.	.	2 of 30 tons each, and 1 for chilling 100 tons.
Orissa	.	.	.	.	2 of 15 tons.
Saurashtra	.	.	.	.	1 of 30 tons.
TOTAL					9

20. Transport of large quantities of fish to inland areas at considerable distances from the coastal centres will require the use of insulated or refrigerated rail transport and we suggest that the Railway Board should examine the feasibility of introducing insulated wagons at the important assembling centres. Insulated road vans will also be useful for supplying fish within short distances of these centres and we have, therefore, provided for 11 such vans as follows :—

Madras (West Coast)	.	.	.	.	2
(East Coast)	.	.	.	.	1
Travancore-Cochin	.	.	.	.	2
West Bengal	.	.	.	.	2
Orissa	.	.	.	.	2
Bombay	.	.	.	.	2
TOTAL					11

Landing facilities for the country craft at the fishing hamlets and minor harbours, particularly along the west coast, require the clearance of silted up approaches, and provision for a dredger has, therefore, been made in the Plan.

SUPPLIES AND MARKETING

21. The fishery trade is beset with middlemen. Almost everything required by fishermen for carrying on their trade—boats, hooks, yarn, and sail cloth—has to be obtained through middlemen to whom they have to part with much of their earnings. A boat is generally manned by 3 to 12 men working as a team. It may be owned by one of them or all may be the employees of an absentee owner. There have been complaints that the right types of supplies are not available to fishermen at reasonable rates and in good time, which means a considerable loss of working hours. The difficulty of getting enough hooks, yarn, twine, nylon and other lines has been repeatedly brought out. A determined effort to organise fishermen's co-operatives and liberalise supplies of essential requirements is necessary to eliminate middlemen and enable fishermen to increase their working hours. In Bombay, Madras and Orissa a good amount of pioneering work has already been done in distributing fishermen's requisites through co-operatives. We would recommend that all supplies should be distributed through co-operative societies as far as possible. Provision of these facilities should attract more men to the fishing industry and result in increased production. About Rs. 60 lakhs have been provided in the Plan to facilitate distribution of supplies and subsidise costly items.

22. Lastly we come to the question of efficient marketing which is of the greatest importance for the development of fisheries and improving the lot of fishermen. Most of the fresh water fish is marketed and consumed as fresh fish. On the other hand, only 20 per cent of the sea fish catch is marketed as fresh fish and the remaining 80 per cent is either preserved as sun-dried fish or as salted fish or converted into fish meal and manure. Increased marketing of sea fish as fresh fish is necessary not only to meet the large unsatisfied demand for fresh fish but also in the interest of the small fisherman, who will get a better return if it can be marketed fresh. It, however, raises the problems of the supply of ice, cold storage and quick transport facilities. Many fishing centres—and these include some of the most important fishing towns on the west and east coasts—have little or no communications with the hinterland. Recently some launches on the west coast have been mechanised for carrying fresh fish and this needs to be further developed. Development of communications and quick transport is a long term process. For many years to come the bulk of the catch has, therefore, to be preserved before it is marketed. Preservation by canning has been tried off and on but the attempts have not been successful. Smoking is almost as universal as salt curing in many countries other than India. Possibly the Indian consumer has little taste for smoked fish. For preservation, therefore, we have very largely to depend on sun drying or salt curing.

23. Preserved fish is very largely used by the poor because of its cheapness. The provision of quick transport and refrigeration plants would increase the supplies of fresh fish but would add to its cost and it would probably be beyond the reach of the poor man. Increasing supplies for the poor man will, therefore, depend on increasing the availability of preserved fish. Facilities for the supply of the requisites of fishermen and the mechanisation of country craft for which we have made provision in the Plan, should result in larger production and, therefore, increased availability of preserved fish.

24. There is considerable scope for improving the quality of preserved fish. Salt impurities result in large-scale spoilage. Useful work has been done in salt curing by the establishment of government curing yards. Fish cured at government yards is generally more wholesome as it is prepared under more hygienic conditions and expert supervision. There is, however, scope for research to determine the best curing seasons and types of cure and the degree of purity and correct proportion of salt required for preserving the different varieties of fish. This research should be intensified. The government yards had become popular because salt was supplied free of excise duty for curing, but with the abolition of the excise duty the differential rate of salt has disappeared and in many areas the people are reverting to curing at private yards. There are only two ways of preventing them from doing so, namely : (1) subsidising the supplies of salt and (2) compulsion. Both of them may be necessary for some time. Salt supplies at the curing yards in Madras, Travancore-Cochin and Saurashtra are subsidised. The Madras State Plan provides Rs. 53·1 lakhs for salt distribution.

25. The margin between the producers' price and the consumers' price even in the case of cured fish is large. Any increase in producers' (fishermen's) margin of profit without raising consumers' price would largely depend on increasing the return per unit of effort by improving the efficiency of fishing operations and eliminating spoilage at stages preparatory to marketing. Reduction in consumers' price without depressing producers' margin would depend

on decreasing handling charges and retailers' margin. It is well known that in most fish markets in India handling is unhygienic and a considerable amount of wastage occurs. Regulation of markets and establishment of planned marketing premises are as essential for improving the quality of the marketed fish as for reducing costs and should receive high priority. Elimination of middlemen by co-operative marketing may bring about some reduction in handling charges as and when efficiency in operations is developed.

26. As large scale fishing operations develop, large catches will be landed at Bombay, Cochin and Calcutta ports on some days of a month when, as a result, conditions of glut may be created which may cause wide fluctuations in prices and, therefore, a feeling of uncertainty in the trade. This would depress prices in the producing centres and as a result the small fishermen would suffer. To protect the interests of the fishermen as well as the consumers the best course would be that the supplies at these three centres should be marketed through co-operatives which should, so far as possible, also operate the ice factories and refrigeration plants. We suggest that the State Governments should take early steps in that direction and arrange for the training of adequate managerial staff for these co-operatives. Meanwhile fish marketing Boards consisting of representatives of fishermen, the trade, the consumers and the State Government may be established at these centres to regulate marketing.

THE FISHERIES PLAN

27. In working out the development programme outlined above we had to allocate certain priorities which were based on a balance of many considerations such as the nature of the fisheries, the availability of resources and technical skill, the present stage of development, the interests of small fishermen and lastly the need for immediate increase in production. For instance, in the maritime State of West Bengal emphasis has been on the development of inland fisheries for which there is very considerable and immediate scope. On the other hand, in Madras, Bombay and Travancore-Cochin the principal schemes relate to the development and expansion of marine fisheries. In the case of inland fisheries the priorities are the survey and stocking of new culturable waters and collection of fry. In the case of marine fisheries the priorities are—

- (1) mechanisation of country craft or introduction of new mechanised boats ;
- (2) harbour facilities ;
- (3) supply of requisites to fishermen ;
- (4) development of marketing ;
- (5) provision of ice and cold storage and transport facilities ;
- (6) introduction of mothership operations ; and
- (7) provision for off-shore fishing with larger powered vessels such as purse-seiners and trawlers.



Based on these priorities the Plan provides for a total expenditure of Rs. 4.6 crores in addition to the provision under the Technical Cooperation Aid Programme. The fisheries programme will raise production from the present figure of 1 million tons to 1.5 million tons at the end of the Plan.

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